

VPDES PERMIT FACT SHEET

This document gives the pertinent information concerning the **reissuance** of the VPDES permit listed below. This permit is being processed as a **major, municipal** permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The discharge results from the operation of a conventional activated sludge plant serving the Montgomery County area. This permit action consists of updating the boilerplate, removing chlorine disinfection requirements and TRC monitoring due to switch to UV disinfection, removal of stormwater management requirements due to coverage under VAR05 general permit, and the addition of biosolids requirements. (SIC Code: 4952)

1. **Facility Name and Address:**

Lower Stroubles Creek WWTP

PO Box 52

Blacksburg, VA 24060

Location: 5277 Prices Fork Road, Blacksburg, VA 24060

2. **Permit No:** VA0060844 Existing Permit Expiration Date: June 6, 2014

3. **Facility/ Owner Contact:**

Mr. Michael E. Vaught, Executive Director, (540) 552-6940

4. **Application Complete Date:** December 6, 2013

Permit Drafted By: Kevin A. Harlow

Date: April 21, 2014

DEQ Regional Office: Blue Ridge Regional Office

Reviewed By: Kip D. Foster, Water Permit Manager

Reviewer's Signature: Bob Tate Date: June 4, 2014

Public Comment Period Dates: From May 3, 2014 To June 3, 2014

5. **Receiving Stream Classification:**

Receiving Stream: New River (River Mile: 71.37)

River Basin: New River

River Subbasin: None

Section: 2a

Class: IV

Special Standards: PWS, v

7-Day, 10-Year Low Flow: 563 MGD 7-Day, 10-Year High Flow: 779 MGD

1-Day, 10-Year Low Flow: 451 MGD 1-Day, 10-Year High Flow: 534 MGD

30-Day, 5-Year Low Flow: 730 MGD Harmonic Mean Flow: 1533 MGD

30-Day, 10-Year Low Flow: 651 MGD High Flow 30Q10: 1076 MGD

Tidal: No 303(d) Listed: Yes

High flow months are January through May.

Attachment A contains a copy of the flow frequency determination memorandum.

6. **Operator License Requirements:** I.

7. **Reliability Class: I**8. **Permit Characterization:**

- ☐ Private ☐ Interim Limits in Other Document
☐ Federal ☐ Possible Interstate Effect
☐ State
☒ POTW
☐ PVOTW

9. **Wastewater Treatment System:** A description of the wastewater treatment system is provided below. See **Attachment B** for the wastewater treatment schematics, site map, and a copy of the site inspection report. Treatment units associated with the discharge are listed in the table below.

Table I
DISCHARGE DESCRIPTION

Outfall Number	Discharge Source	Treatment (Unit by Unit)	Flow (Design) (MGD)
001	Lower Stroubles Creek WWTP	Mechanical screen and pump station; aerated dual grit chamber; primary settling with grease removal; activated sludge with biological nitrification / denitrification; secondary clarifiers; UV disinfection; sludge thickening with dissolved air flotation; sludge dewatering with centrifuge; thru March 2016: sludge incineration; ash disposal incineration; after 3/16: autothermal thermophilic aerobic digestion to produce Class A biosolids to be landfilled, distributed, or land applied.	9 MGD

The Blacksburg-VPI Sanitation Authority operates a 9 MGD conventional activated sludge system consisting of grit removal, primary clarification, activated sludge system with biological nitrogen removal, secondary clarification, and UV disinfection. Until about March, 2016, sludge treatment consists of sludge thickening with dissolved air flotation, centrifugation, and incineration. After this date, sludge will be treated using an autothermal thermophilic aerobic digestion system for the production of Class A biosolids. The biosolids will be dewatered using

centrifugation and the dewatered biosolids may be landfilled at the New River Resource Authority or the bulk biosolids may be distributed for off-site blending or agricultural land application.

Outfalls 003, 004, 005, 006, and 007, previously permitted stormwater outfalls, have been removed from the permit due to stormwater coverage under a separate VAR05 general permit.

10. **Sewage Sludge Use or Disposal:** A VPDES Sewage Sludge Permit Application Form was submitted for this facility to address disposal of sewage sludge from the wastewater treatment facility. Sludge is thickened with dissolved air flotation and then dewatered with centrifuge. Until approximately March, 2016 the dried sludge is incinerated. Ash from the incinerator is stored in two earthen ponds and dewatered on a concrete drying pad prior to disposal at the New River Resource Authority. After March, 2016 sludge is to be treated by an autothermal thermophilic aerobic digestion system capable of producing Class A biosolids to be provided to a permitted blending operation (a Class A type disposal method) or to a permitted bulk land applier (a Class B type disposal method) while not paying the \$7.50/ton fee. If they are unable to meet the Class A biosolids requirements then they could still landfill.
11. **Discharge Location Description:** A USGS topographic map which indicates the discharge location, any significant dischargers, any water intakes, and other items of interest is included in **Attachment D**. The latitude and longitude of the discharge are N 37°11'29", E 80°31'34".

Name of Topo: Radford North, Virginia Number: 082A

Outfall 001 discharges to the New River at the Radford Army Ammunition Plant.

12. **Material Storage:**

Tank ID	Tank Capacity (gallons)	Tank Contents	Storage Facilities
AST	2-9,816 gallon tanks	Fuel oil	Double-walled tank
AST	5,155 gallon tank	Fuel oil	Double-walled tank
Canisters	30 gallons	Propane canisters	Adjacent to Solids Handling Building and Electrical Distribution Building
Container	4,000 pounds	Polymer	Solids Handling Building
Containers	1,000 gallons	Lubricants and Oils	Control Building/Workshop
Containers	Varies	Miscellaneous Chemicals	Laboratory

13. **Ambient Water Quality Information:** Memoranda or other information which helped to

develop permit conditions (special water quality studies, STORET data, and any other biological and/or chemical data, etc.) are listed below.

The receiving water body is the New River, which is within Section 2a of the New River basin as listed in the State Water Control Board's Water Quality Standards (WQS), River Basin Section Tables (9 VAC 25-260-430). The receiving stream is Class IV and is a Public Water Supply (PWS) with special standard 'v'. Class IV water quality standards include the following:

dissolved oxygen – 4.0 mg/L minimum and 5.0 mg/L daily average,
pH – 6.0 to 9.0 SU,
temperature – 31°C maximum.

The “v” special standard (Virginia Water Quality Standards 9 VAC 25-260-310.v) mandates a maximum temperature of 29°C.

Lower Stroubles Creek WWTP discharges into the New River in the New River/Toms Creek/Back Creek/Stroubles Creek Watershed (VAW-N22R) as described in the Integrated 2012 Water Quality Assessment and 303(d) Impaired Waters Fact Sheet (**Attachment C**). This segment has been listed as impaired due to PCBs in fish tissue.

Flow frequencies for outfall 001 were determined by using flow frequencies for the gauge located at the Route 11 bridge in Radford, Virginia. The flow frequencies of the discharge point were determined using drainage area proportions and have been reduced by the volume of the Radford Arsenal WTP#1 withdrawal, the Blacksburg-Christiansburg-VPI Water Authority WTP withdrawal, and increased by the Christiansburg WWTP discharge, Peppers Ferry WWTP discharge, and the upstream RAAP discharges because these withdrawals and discharges are located between the gauge and the outfall 001 Lower Stroubles Creek WWTP discharge point. **Attachment A** contains a copy of the flow frequency determination memorandum.

STORET monitoring station (9-NEW081.72), located at the Route 11 bridge in Radford, has been used to determine instream average hardness and 90th percentile pH and temperature values. The monitoring data for this station are included in **Attachment C**.

Stream data and effluent data used to determine 90th percentile pH and temperature values for the wasteload allocation (WLA) spreadsheet are included in **Attachment D**. The permit limits are established by determining wasteload allocations that will result in attaining and/or maintaining all water quality criteria that apply. The WLAs will provide for the protection and maintenance of all existing uses. See **Attachment D** for the wasteload allocation spreadsheet.

14. **Antidegradation Review and Comments:** Tier I _____ Tier II X Tier III _____

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier I or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier II water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier II waters is not allowed without an evaluation of the economic and social impacts. Tier III water bodies

are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with the Tier determination. The 2012 Impaired Waters fact sheet indicates the receiving segment of the New River is impaired for "PCB in Fish Tissue" and not supporting the fish consumption use. (Attachment E contains the 2012 Impaired Waters fact sheet.) Because the impairment is determined by PCBs in fish tissue rather than PCBs in the water column, a Tier II designation is appropriate. Therefore the New River at the discharge location is classified as a Tier II water, and no significant degradation of existing quality is allowed.

For purposes of aquatic life protection, "significant degradation" means that no more than 25% the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10% of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The significant degradation baseline (antidegradation baseline) is calculated for each pollutant as follows:

$$\text{Antidegradation baseline (aquatic life)} = 0.25 (\text{WQS} - \text{existing quality}) + \text{existing quality}$$

$$\text{Antidegradation baseline (human health)} = 0.10 (\text{WQS} - \text{existing quality}) + \text{existing quality}$$

Where:

"WQS" = Numeric criterion listed in 9 VAC 25-260-5 et seq. for the parameter analyzed

"Existing quality" = Concentration of the parameter being analyzed in the receiving stream, including the facility's existing discharge.

When applied, the antidegradation baselines become the new water quality criteria to prevent significant degradation of the receiving stream. Effluent limits for future expansions or new facilities must be written to maintain the antidegradation baselines for each pollutant. Prior to expansion the antidegradation baselines will be calculated for this facility as described above, in accordance with Guidance Memorandum GM00-2011. Permit limits are in compliance with antidegradation requirements set forth in the 9 VAC 25-260-30.

15. **Site Inspection:** Date: 5/10/2011 Performed by: Gerald Duff
Attachment B contains a copy of the site inspection memorandum.
16. **Effluent Screening and Limitation Development:** DEQ Guidance Memorandum 00-2011 was used in developing all water quality based limits pursuant to water quality standards (9 VAC 25-260-5 et seq.). Refer to **Attachment D** for the wasteload allocation spreadsheet and effluent limit calculations. See **Table II** on page 14 for a summary of limits and monitoring requirements.

Reduced Monitoring: All permit applications received after May 4, 1998, are to be considered for reduction in effluent monitoring frequency. GM 98-2005 states that "only facilities having exemplary operations that consistently meet permit requirements should be considered for reduced monitoring." The facility is eligible for reduced effluent monitoring frequencies due to

exemplary operations as determined by a lack of compliance activity (Warning Letters, Notice of Violations, etc.).

A. Mixing Zone

The MIXER program was run to determine the percentage of the receiving stream flow to be used when calculating the wasteload allocations (WLAs). The program output indicated that 100 percent of the 7Q10, 100 percent of the 30Q10, and 5.41 percent of 1Q10 may be used for calculating acute and chronic wasteload allocations (WLAs). A copy of the print out from the MIXER run is enclosed in **Attachment A**.

B. Effluent Limitations for Conventional Pollutants

Flow -- The permitted **design flow of 9 MGD** for this facility is taken from the previous permit and the application for the reissuance. In accordance with the VPDES Permit Manual, flow is to be continuously measured with a sample type of Totalizing, Indicating, and Recording.

pH -- The pH limits of **6.0 S.U. minimum and 9.0 S.U. maximum** have been continued from the previous permit. These limits are based upon the water quality criteria in 9 VAC 25-260-50 for Class IV receiving waters and are in accordance with federal technology-based guidelines, 40 CFR Part 133, for secondary treatment. Grab samples shall be collected once per day in accordance with the VPDES Permit Manual recommendations.

Total Suspended Solids (TSS) -- TSS limits are technology-based requirements set in the 1975 issuance for the proposed 9 MGD facility and comply with technology-based requirements for municipal dischargers of secondary treatment required in accordance with 40 CFR Part 133. Effluent limits of **24 mg/l, 810 kg/d as a monthly average and 36 mg/l, 1220 kg/d as a maximum weekly average** have been required for TSS. The VPDES Permit Manual recommends a monitoring frequency for TSS of 5-7 Days/Week for a >2 MGD design facility. However, in accordance with Guidance Memorandum 98-2005 and the monitoring frequency reduction section of the VPDES Permit Manual, the monitoring frequency for TSS is reduced to once per week (1/wk) using 24 hour composite samples due to the ratio of composite long term average to monthly average permit limit being less than 0.25. See **Attachment D** for the effluent data and ratios.

Biochemical Oxygen Demand (BOD₅), Dissolved Oxygen (DO) -- The baselines for DO and BOD₅ were established for this segment when the facility began the discharge to the New River. The final limits for BOD₅ of 24 mg/l and 36 mg/l maximum weekly average and a minimum DO of 6.6 mg/l were established in the 1994 permit reissuance using the regional dissolved oxygen model. The loading limits are expressed to two significant digits, 810 kg/day and 1200 kg/day respectively, as recommended in Guidance Memo 06-2016. **Attachment D** contains the model results required to meet the DO water quality criteria in 9 VAC 25-260-50 for Class IV receiving waters. These limits were established for the 6.0 MGD facility. A simplified DO model was run for the 9.0

MGD facility. This model did not predict a reasonable potential to violate antidegradation by maintaining the 24/36 mg/l effluent limitations. 24 hour composite samples for BOD₅ and grab samples for DO are required. The VPDES Permit Manual recommends a monitoring frequency for BOD₅ of 5-7 Days/Week for a >2 MGD design facility. However, in accordance with Guidance Memorandum 98-2005 and the monitoring frequency reduction section of the VPDES Permit Manual, the monitoring frequency for BOD₅ is reduced to once per week (1/wk) using 24 hour composite samples due to the ratio of composite long term average to monthly average permit limit being less than 0.25. See **Attachment D** for the effluent data and ratios. Since there were no exceedances of the limit during the current permit term, the monitoring frequency reduction for DO from 1/day to 5 days/week has been continued from the previous permit.

C. Effluent Limitation Evaluation for Non-Conventional and Toxic Pollutants

In addition to the standard limitations, the discharge must be evaluated to determine whether there is a reasonable potential for the effluent to violate the water quality standards (WQSs) adopted by the State Water Control Board (9 VAC 25-260 et. seq).

E. Coli – The E. coli monthly average limit, calculated as a **geometric mean, of 126 N/100ml** is continued. The facility uses UV disinfection. Monitoring will be performed once per day using grab samples in accordance with the recommended sample type and frequency for >2.0 MGD design flow facilities using alternate disinfection (UV).

Whole Effluent Toxicity (WET) -- The facility conducted acute and chronic toxicity tests on effluent from Outfall 001 using both *P. promelas* and *C. dubia* to fulfill both permit and application monitoring requirements. The facility achieved a TU_a≤1 or a TU_c=1 in all tests except for a 2011 chronic test on *P. promelas* in which the TU_c was 3.16. Using the chronic *P. promelas* TU_c data, the WETLIM10 calculated the WLAc to use in the reasonable potential analysis. No limit is needed based on STATS.exe and the calculated WLAc. Annual chronic whole effluent toxicity monitoring using *Ceriodaphnia dubia* and *Pimephales promelas* shall be performed, with the 48-hr LC50 reported. See **Attachment E** for a compilation of the toxicity testing data.

Toxic Pollutants with Non <QL Results on Application

The application indicated the following parameters with above quantification level results. A comparison of the maximum values reported to the anti-deg WLA in the WLA spreadsheet in Attachment D shows that the maximum values were all less than 10% of the anti-deg WLA. Therefore no reasonable potential exists to exceed water quality standards.

Parameter	Maximum (mg/L)	Average (mg/L)
Ammonia	1.4	0.5
Nitrate	15.1	11.7
TDS	314	302
Zinc	0.0504	0.0437
Chloroform	0.0088	0.0036

- D. Stormwater** – The owner submitted a VPDES General Permit Registration Statement for Industrial Activity Storm Water Discharges (VAR05) with a request that the stormwater component of the individual VA0060844 VPDES be removed and stormwater covered under a separate VAR05 permit. There are no stormwater effluent limitations or requirements more stringent than the VAR05 permit so there are no anti-backsliding issues or other concerns with their separation. Therefore the stormwater portion of the permit has been removed and will be covered under a VAR05 general permit. Stormwater Outfalls 003, 004, 005, 006, and 007 are removed from this permit.

17. **Basis for Sludge Use and Disposal Requirements:** The facility will continue to incinerate sludge and haul the ash to a landfill until approximately March, 2016. During this period there are no sludge limits or monitoring requirements. Alternatively, sludge may be disposed at the New River Resource Authority landfill. Following the replacement of the incineration system by an autothermal thermophilic aerobic digestion (ATAD) process will produce Class A biosolids to be provided to a permitted blending operation (a Class A type disposal method) or to a permitted bulk land applier (a Class B type disposal method) while not paying the \$7.50/ton fee. If they are unable to meet the Class A biosolids requirements then they could still landfill.

Class A Biosolids

Sewage sludge and land application site permit limitations and monitoring are required based on the VPDES Permit Regulation (9 VAC 25-31-10 et seq.) Part VI, Standards for the Use of Disposal of Sewage Sludge, and 40 CFR Part 503. Land application is to be performed in accordance with the Biosolids Use Regulation (BUR) permits issued to the land appliers. The BUR permit contains maps showing land application sites in counties and cities of application. Sludge characterization data with respect to metals is to be submitted prior to the initial transfer for land application. The facility's biosolids meet the following treatment standards: Class A Pathogen Reduction Alternative: Either Alternative 1 or Alternative 5 with PFRP 4 Thermophilic Aerobic Digestion and Vector Attraction Reduction (VAR): Option 1-38% VS reduction. Based upon the estimated production of 480 dry tons per year, monitoring will be performed quarterly.

Management, recordkeeping, and reporting requirements for sludge subject to PC/CPLR limitations are also included in the permit. The permittee is also required to certify that pathogen reduction, vector attraction reduction, management practices, and site restrictions specified in the permit are being met.

18. **Antibacksliding Statement:** Since there are no limitations less stringent than the previous permit, the permit limits comply with the antibacksliding requirements of 9 VAC 25-31-220 L of the VPDES Permit Regulation. Total residual chlorine (TRC) effluent limitations have been removed due to a switch to UV disinfection during the 2009 permit term. The TRC ceased to be effective upon the cessation of chlorine disinfection during the 2009 permit term, in accordance with Part I.B of the 2009 permit. Also, there were no stormwater effluent limitations prior to the removal of the stormwater coverage from this permit and coverage under a separate VAR05 permit.
19. **Compliance Schedule:** For this reissuance, there are no compliance schedules.
20. **Special Conditions:** A brief rationale for each special condition contained in the permit is given below.

A. **Compliance Reporting**

Rationale: In accordance with VPDES Permit Regulation, 9 VAC 25-31-190 J4 and 220 I, DEQ is authorized to establish monitoring methods and procedures to compile and analyze data on water quality, as per 40 CFR Part 130, Water Quality Planning and Management, Subpart 130.4. This condition is necessary when toxic pollutants are monitored by the permittee and a maximum level of quantification and/or specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. This condition also establishes protocols for calculation of reported values.

B. **95% Capacity Reopener (Part I.B.2)**

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 2 for all POTW and PVOTW permits.

C. **Indirect Dischargers (Part I.B.3)**

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-200 B 1 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

D. **O&M Manual Requirement (Part I.B.4)**

Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790; VPDES Permit Regulation, 9 VAC 25-31-190 E.

E. **Licensed Operator Requirement (Part I.B.5)**

Rationale: The VPDES Permit Regulation, 9 VAC 25-31-200 D and the Code of Virginia § 54.1-2300 et seq, Rules and Regulations for Waterworks and Wastewater Works Operators (18 VAC 160-20-10 et seq.), require licensure of operators.

F. Reliability Class (Part I.B.6)

Rationale: Required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal facilities.

G. Biosolids/Sludge Reopener (Part I.B.7)

Rationale: Required by VPDES Permit Regulation, 9 VAC 25-31-220 C 4 for all permits issued to treatment works treating domestic sewage.

H. Biosolids/Sludge Use and Disposal (Part I.B.8)

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100 P; 220 B 2; and 420 through 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal. Technical requirements may be derived from the Department of Health's Biosolids Use Regulations, 12 VAC 5-585-10 et seq.

I. Effluent Monitoring Frequencies (Part I.B.9)

Rationale: Permittees are granted a reduction in monitoring frequency based on a history of permit compliance. To remain eligible for the reduction, the permittee should not have violations related to the effluent limits for which reduced frequencies were granted. If permittees fail to maintain the previous level of performance, the baseline monitoring frequencies should be reinstated for those parameters that were previously granted a monitoring frequency reduction.

J. Bypass Point (Part I.B.10)

Rationale: This condition is included in accordance with the VPDES Permit Manual. The bypass point is identified, but the discharge from it is not authorized.

K. Section 303(d) List (TMDL) Reopener (Part I.B.11)

Rationale: Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The re-opener recognizes that, according to section 402(o)(1) of the Clean Water Act, limits and/or conditions may be either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under section 303 of the Act.

L. CTO, CTC Requirement (Part I.B.12)

Rationale: Required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790.

M. Polychlorinated Biphenyl Compound Pollutant Minimization Plan (Part I.B.13)

Rationale: State Water Control Law § 62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State Waters and Section 303(d) of the Clean Water Act requires that total maximum daily loads (TMDLs) be developed for streams listed as impaired. Development of a PCB Total Maximum Daily Load (TMDL) requires consideration of the Virginia water quality criterion for Total PCBs (9 VAC 25-260-140) to protect the "fishable" designated use (9 VAC 25-260-10). This special condition allows for the requirement to develop a Pollutant Minimization Plan should a reduction in PCBs be necessary to bring the discharge into compliance with the water quality standards or an approved TMDL.

N. Pretreatment (Part I.C)

Rationale: VPDES Permit Regulation, 9 VAC 25-31-730 through 900, and 40 CFR part 403 require certain existing and new sources of pollution to meet specified regulations.

The due date for the data and reports for the local limits reevaluation required in Part I.C.9 is December 31, 2016. This later date is to allow for the a period of plant acclimation and stabilization following an anticipated date of March, 2016 for a change in the solids treatment process from incineration to aerobic digestion.

O. Toxics Monitoring Program (I.D)

Rationale: VPDES Permit Regulation, 9 VAC 25-31-210 and 220I, requires monitoring in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. This requirement is included due to the pretreatment program requirement.

P. Annual Report (Part I.E.1)

Rationale: 9 VAC 25-31-590 of the VPDES Permit Regulation and 9 VAC 25-32-440.D of the VPA Permit Regulation require the submittal of certain permit requirements for the previous calendar year's activities on February 19th of each year.

Q. Notice and Necessary Information (NANI) (Part I.E.2)

Rationale: In accordance with 9 VAC 25-31-530 F, when a person who prepares bulk biosolids provides the bulk biosolids to a person who applies the bulk biosolids to the land, the person who prepares the bulk biosolids shall provide the person who applies the biosolids notice and necessary information to comply with the requirements in this article.

R. Class A Biosolids Record Keeping (Part I.E.3)

Rationale: Required by the VPDES Permit Regulation Part VI, 9 VAC 25-31-420 through 720, for generators who land apply sewage sludge generated during the treatment of domestic sewage in a treatment works.

S. Records Retention (Part I.E.4)

Rationale: 9 VAC 25-31-580.A.5.b of the VPDES Permit Regulation and 9 VAC 32-80.H.2 of the VPA Permit Regulation require that specified biosolids documentation be maintained for at least 5 years.

T. Biosolids Management Plan (BSMP) (Part I.E.5)

Rationale: VPDES Permit Regulation, 9 VAC 25-31-485 G requires the permit holder to maintain and implement a Biosolids Management Plan (BSMP) consisting of Operations and Maintenance Manual and permit application with associated sludge management plan and states that the BSMP is an enforceable part of the permit. Also, 9 VAC 25-31-100 Q.2 requires an Odor Control Plan. The VPDES Permit Regulation, 9 VAC 25-31-100 Q; 220 B.2; and 420 and 720, and 40 CFR Part 503 require all treatment works treating domestic sewage to submit information on sludge use and disposal practices and to meet specified standards for sludge use and disposal.

U. Offsite Spill Reporting (Part I.E.6)

Rationale: In accordance with 9 VAC 25-32-540 of the VPA Permit Regulation requires prompt notification of offsite spills.

V. Conditions Applicable to All VPDES Permits (Part II)

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. Changes to the Permit:

Special conditions have been renumbered due to the removal of the old Section I.B – Additional Disinfection Requirements. Special condition boilerplate language has been updated to reflect changes in the VPDES permit manual.

A. The following special conditions have been deleted from the permit:

1. Additional Total Residual Chlorine (TRC) Limitations and Monitoring Requirements (Old Part I.B) has been removed since the facility no longer uses chlorine for disinfection.

2. The PCB Monitoring special condition (Old Part I.C.13) is removed due to the adequate data collection in the 2009 permit.
3. Stormwater coverage has been removed from this permit to be covered under a separate VAR05 permit. Therefore Parts I.E, I.F, and I.G are deleted from the permit. The effluent limitations page for stormwater Outfalls 003, 004, 005, 006, and 007 is deleted as well.

B. Special conditions that have been modified from the previous permit are listed below: (The referenced permit sections are for the new permit.)

1. The Toxicity Management Program (Part I.D) has been modified to require annual chronic whole effluent toxicity monitoring using *Ceriodaphnia dubia* and *Pimephales promelas*, with the 48-hr LC50 also to be reported.

C. New special conditions added to the permit are listed below:

1. A Pollutant Minimization Plan (Part I.C.13) requirement is added in case the collected data exceed water quality standards or the wasteload allocation assigned by an approved TMDL.
2. Biosolids special conditions (Part I.E) have been added.

D. Changes to Permit Limits and Monitoring Requirements: No changes to effluent limitations currently in effect have been made.

1. The sample type for flow is changed from recorded to "Totalizing, Indicating, and Recording".
2. TRC limitations are removed from the effluent limitations page since chlorine is no longer the method of disinfection.
3. The E.coli monitoring frequency on the effluent limitations page has been changed from 2/month to 1/day. The 1/day frequency has been in effect since the switch to UV disinfection, as required by the former Part I.B.
4. Additional TRC monitoring/disinfection requirements of the old Part I.B have been removed since the facility no longer uses chlorine for disinfection.
5. Class A biosolids monitoring requirements have been added in Part I.A.2.

22. Variances/Alternate Limits or Conditions: None.

23. Regulation of Treatment Works Users: The VPDES Permit Regulation, 9 VAC 25-31-280 B9, requires that every permit issued to a treatment works owned by a person other than a state or municipality provide an explanation of the Board's decision on the regulation of users. Blacksburg Sanitation Authority, a municipality, owns this treatment works; therefore this regulation does not apply.

24. **Public Notice Information required by 9 VAC 25-31-280 B:**

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting Kevin A. Harlow at:

Virginia DEQ
Blue Ridge Regional Office
3019 Peters Creek Road
Roanoke, VA 24019
540-562-6700
Kevin.Harlow@deq.virginia.gov

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at the DEQ Blue Ridge Regional Office by appointment.

25. **Additional Comments:**

A. **Previous Board Action:** None

B. **Staff Comments:** The discharge is not controversial. The discharge is in conformance with the existing planning document for the area.

C. **Public Comments:** No comments received.

26. **303(d) Listed Segments (TMDL):** This facility discharges directly to the New River. The stream segment receiving the effluent is listed as impaired for PCB on the current 303(d) list. The impaired use is fish consumption and the cause is PCB in fish tissue. The associated TMDL is expected to be developed late in 2014 and possibly complete in 2015. This permit contains a TMDL reopener condition should an approved PCB TMDL contain a wasteload allocation for the facility.

Table II -1
BASIS FOR LIMITATIONS – MUNICIPAL

() Interim Limitations
(x) Final Limitations

OUTFALL: 001
DESIGN CAPACITY: 9.0 MGD

Effective Dates - From: Effective Date
To: Expiration Date

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	Continuous	T,I, and R
pH (Standard Units)	1,3	NA	NA	6.0	9.0	1/Day	Grab
BOD ₅	4	24 mg/l 810 kg/d	36 mg/l 1200 kg/d	NA	NA	1/Week	24 HC
Total Suspended Solids	2	24 mg/l 810 kg/d	36 mg/l 1200 kg/d	NA	NA	1/Week	24 HC
Dissolved Oxygen	3,4	NA	NA	6.6 mg/l	NA	5 Days/Week	Grab
E. coli	3	126 N/100ml (geometric mean)	NA	NA	NA	1/Day	Grab

NA = Not Applicable
NL = No Limitations; monitoring only
24HC= 24 hour composite

The basis for the limitations codes are:

1. Federal Technology-Based Secondary Treatment Regulation (40 CFR Part 133)
2. Technology-Based
3. Water Quality Criteria
4. Other -- Water Quality Regional Model

Table III
PERMIT PROCESSING CHANGE SHEET

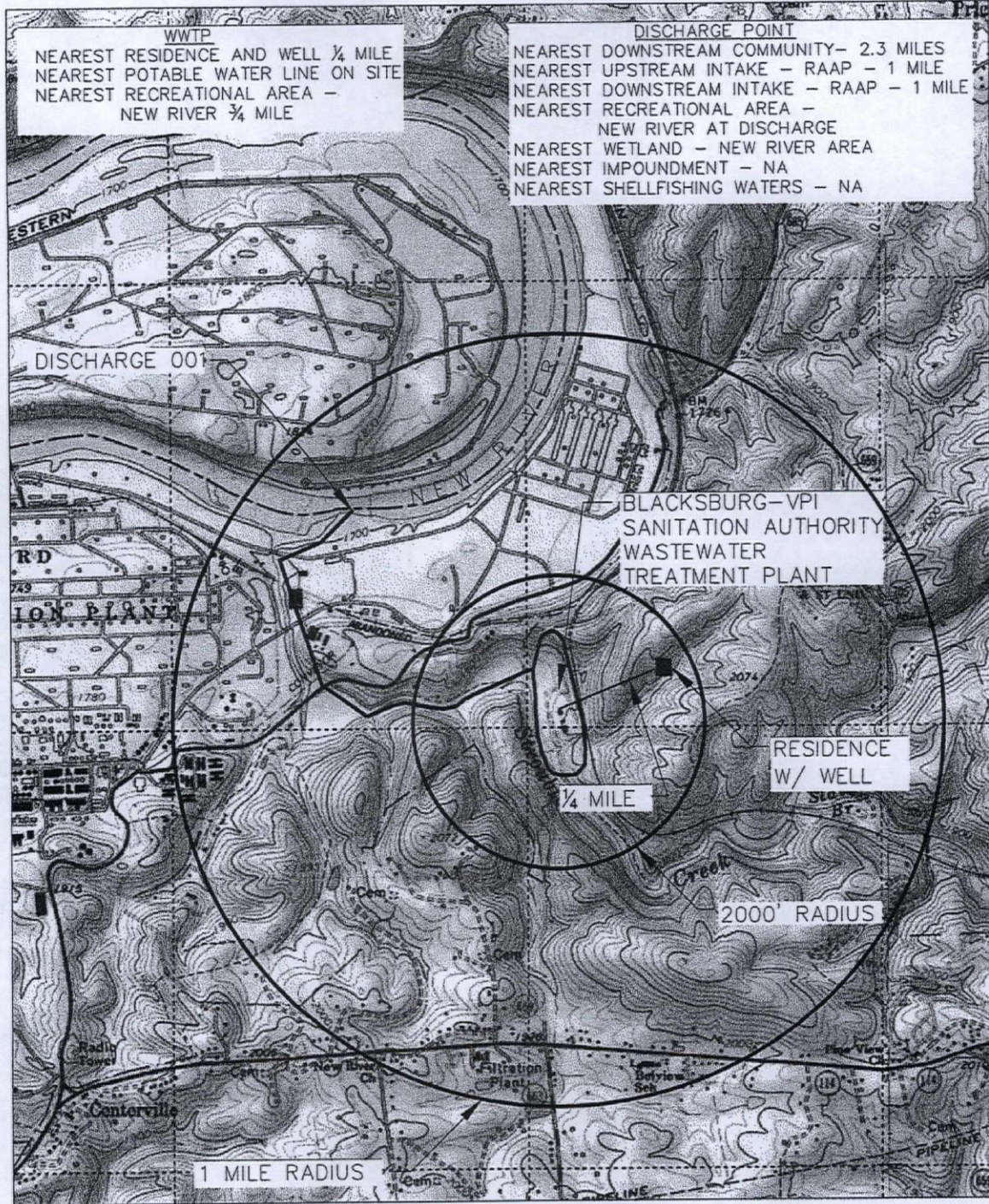
LIMITS AND MONITORING SCHEDULE:

Outfall No.	Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Reason for Change
		From	To	From	To	
001	TRC	1/Day	None	0.0031 mg/L monthly average; 0.0038 ml/L max weekly	N/A	Facility switch from chlorine disinfection to UV disinfection

Attachment A

- **USGS Topographic Map**
- **Flow Frequency Memorandum**
- **Mixing Zone Analysis**

File: V:\PROJECTS\BVA\21464\10729.03-VPDES\FIGURES\FIG 1.DWG Saved: 12/2/2013 2:10:28 PM Plotted: 12/2/2013 2:11:08 PM User: Hodge, Chris LastSavedBy: 3771



MAP TAKEN FROM NATIONAL GEOGRAPHIC TOPO, BLACKSBURG, VIRGINIA

SCALE: 1" = 2000'

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CHA
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Blacksburg, VA 24060
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BLACKSBURG - VPI SANITATION AUTHORITY
VPDES PERMIT APPLICATION

SITE LOCATION MAP

PROJECT NO.
21464

DATE: 12/2013

FIGURE 1

MEMORANDUM
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER DIVISION
Blue Ridge Regional Office

Subject: Flow Frequencies Determinations for Reissuance of VPDES Permit VA0060844;
Lower Stroubles Creek WWTP

To: Permit File

From: Kevin Harlow, Water Permit Writer

Date: April 14, 2014

Attachments: flow calculations spreadsheet; New River withdrawals and discharges data sheet

The Lower Stroubles Creek WWTP discharges treated wastewater to the New River below its confluence with Stroubles Creek near Radford, VA. Stream flow frequencies are required at this site for use in developing effluent limitations for the VPDES permit.

The USGS has operated a continuous record gauge on the New River at Radford, VA (#0317100) since 1940. The gauge is located at the Route 11 bridge in Radford, VA. The flow frequencies for the gauge and the discharge point are presented below. The values at the discharge point were calculated using drainage area proportions and account for known withdrawals and discharges located between the gauge and the discharge point, Outfall 001. (Withdrawals and discharges are explained in the next page.) This analysis does not address any other withdrawals, discharges, or springs between the gauge and the discharge point which may influence flow in the New River.

New River at Radford, VA (#03171000)

Drainage Area = 2748 mi²

1Q30 = 678 cfs	
1Q10 = 719 cfs	High Flow* 1Q10 = 840 cfs
7Q10 = 887 cfs	High Flow* 7Q10 = 1210 cfs
30Q10 = 1020 cfs	High Flow* 30Q10 = 1660 cfs
30Q5 = 1140 cfs	Harmonic Mean* = 2350 cfs

Using drainage area proportions, the river flows were projected to just above the outfall.

New River above discharge point

Drainage Area = 2815 mi²

1Q30 = 695 cfs = 449 MGD	
1Q10 = 737 cfs = 476 MGD	High Flow* 1Q10 = 860 cfs = 556 MGD
7Q10 = 909 cfs = 587 MGD	High Flow* 7Q10 = 1240 cfs = 801 MGD
30Q10 = 1045 cfs = 675 MGD	High Flow* 30Q10 = 1700 cfs = 1099 MGD
30Q5 = 1168 cfs = 754 MGD	Harmonic Mean* = 2407 cfs = 1555 MGD

Withdrawals by the NRV Regional Water Authority (formerly Blacksburg-Christiansburg-VPI Water Authority) and the Radford Army Ammunition Plant (RAAP) intake #1 are incorporated into the analysis. NRV and RAAP withdrawal data for the five calendar years (2009-2013) before permit reissuance are from the Virginia Water Use Data System and the Virginia Annual Water Withdrawal Reports. Wasted water returned to the New River by the WTPs is not accounted. Discharges from the Christiansburg Wastewater Treatment Plant (WWTP), Peppers Ferry Wastewater Treatment Authority, and RAAP are also incorporated into the analysis. WWTP monthly average discharge data are from discharge monitoring reports for the same five calendar years (2009-2013).

For a very conservative analysis, maximum daily withdrawal values are calculated for the NRV and RAAP facilities. Maximum daily values are calculated for both high flow and low flow months during 2009-2013. Similarly, minimum monthly average discharge values for Christiansburg WWTP, Peppers Ferry WWTP, and RAAP (Outfalls 004, 005, 006, 007, 014, 026, 029) for both high flow and low flow months are used. Withdrawal and discharge data are attached.

The conservative net flow of withdrawals and discharge during high flow periods* is -22.0 MGD. The conservative net flow of withdrawals and discharge during low flow periods is -22.4 MGD.

Accounting for withdrawals and discharges, the flow frequencies at the discharge point are shown below.

New River above discharge point

Drainage Area = 2,815 mi²

$$1Q30 = 449 - 22.0 = 424 \text{ MGD}$$

$$1Q10 = 476 - 22.0 = 451 \text{ MGD}$$

$$7Q10 = 587 - 22.0 = 563 \text{ MGD}$$

$$30Q10 = 675 - 22.0 = 651 \text{ MGD}$$

$$30Q5 = 754 - 22.0 = 730 \text{ MGD}$$

$$\text{High Flow* } 1Q10 = 556 - 22.4 = 534 \text{ MGD}$$

$$\text{High Flow* } 7Q10 = 801 - 22.4 = 779 \text{ MGD}$$

$$\text{High Flow* } 30Q10 = 1099 - 22.4 = 1076 \text{ MGD}$$

$$\text{Harmonic Mean*} = 1555 - 22.4 = 1533 \text{ MGD}$$

*High flow months are January through May.

Step-by-step flow calculations are in the attached spreadsheet. Gauge flow frequencies were compiled in 2005 with data collected through water year 2003. Subsequent (updated) gauge "low flow" statistics differ 2% or less from those compiled in 2005. Updated gauge "high flow" statistics are not available. Thus "2005" data are used for gauge flows.

FLOW CALCULATIONS

SITE OF INTEREST	DRAINAGE AREA	CALCULATION	HARMEAN	HF30Q10	HF7Q10	HF1Q10	Z30Q5	Z30Q10	Z7Q10	Z1Q10	Z1Q30	UNIT
New River at Radford, Va.	2,748	A	2350	1660	1210	840	1140	1020	887	719	678	cfs
New River above discharge point	2,815	$B = 2815/2748 \times A$	2407	1700	1240	860	1168	1045	909	737	695	cfs
New River above discharge point		$C = 0.646 \times B$	1555	1099	801	556	754	675	587	476	449	MGD
high flow net withdrawal/discharge		D	-22.01	-22.01	-22.01	-22.01						MGD
low flow net withdrawal/discharge		D					-24.39	-24.39	-24.39	-24.39	-24.39	MGD
flow frequency at discharge point		$E = C + D$	1533	1076	779	534	730	651	563	451	424	MGD

HFMTHS	STATPERIOD	YRSTRN	NOTES
JAN-MAY	1940-2003	2005	Flow Regulated since 1939 by Claytor Reservoir

Mixer Output.txt

Mixing Zone Predictions for

Lower Stroubles Creek WWTP - VA0060844

Effluent Flow = 9.0 MGD
Stream 7Q10 = 563 MGD
Stream 30Q10 = 651 MGD
Stream 1Q10 = 451 MGD
Stream slope = 0.001 ft/ft
Stream width = 350 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = 2.9218 ft
Length = 47339.27 ft
Velocity = .8658 ft/sec
Residence Time = .6328 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = 3.1857 ft
Length = 44005.06 ft
Velocity = .9163 ft/sec
Residence Time = .5558 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = 2.5617 ft
Length = 52895.55 ft
Velocity = .7942 ft/sec
Residence Time = 18.5005 hours

Recommendation:

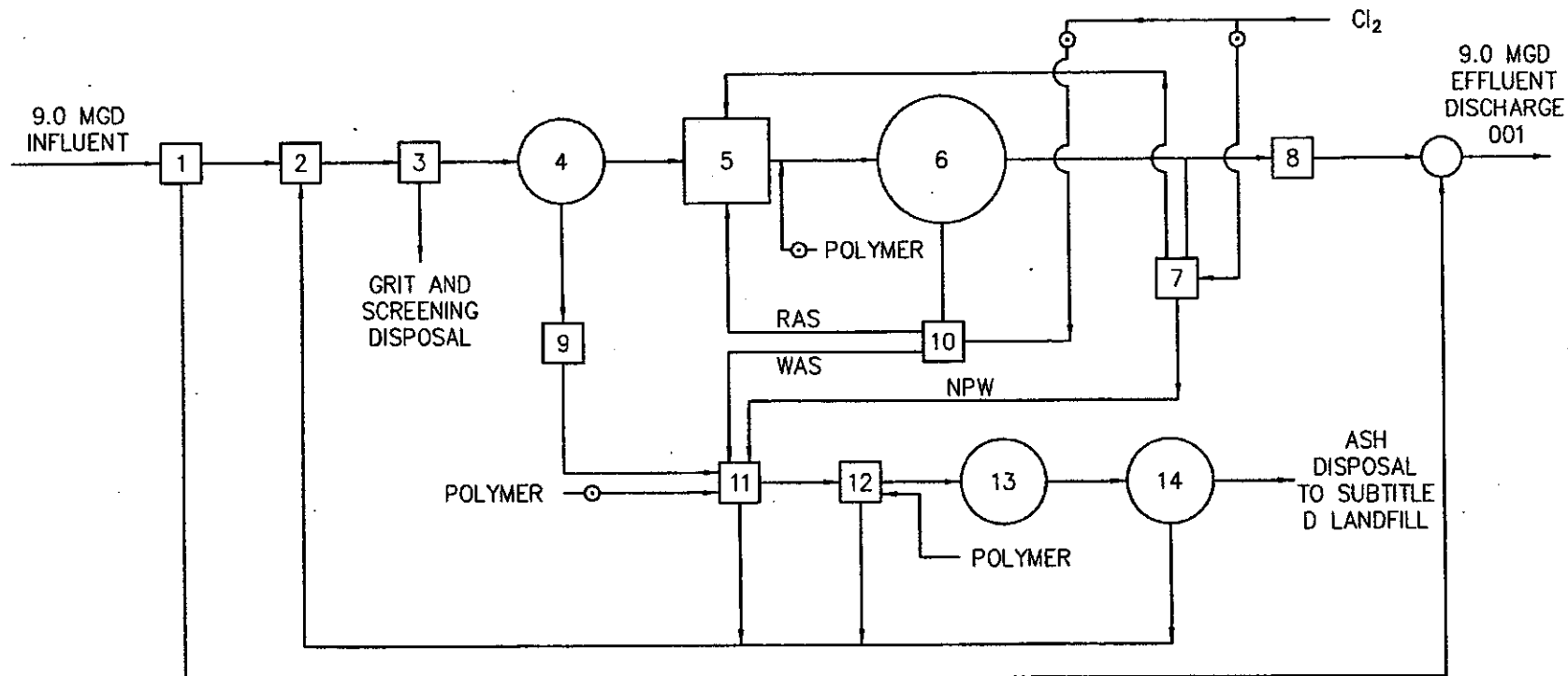
A complete mix assumption is appropriate for this situation providing no more than 5.41% of the 1Q10 is used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Attachment B

- **Wastewater Schematics**
- **Facility Site Map**
- **Inspection Report**

1. BAR SCREEN BUILDING
 2. SCREW PUMPS & METERING
 3. GRIT REMOVAL
 4. PRIMARY SETTLING (2)
 5. AERATION (3)
 6. FINAL SETTLING (4)
 7. NON-POTABLE WATER PUMPING
 8. ULTRAVIOLET DISINFECTION (3)
 9. PRIMARY SLUDGE PUMPING
 10. ACTIVATED SLUDGE PUMPING
 11. DISSOLVED AIR FLOTATION (1) & ROTARY DRUM THICKENER (1)
 12. CENTRIFUGE (2)
 13. INCINERATION
 14. ASH PONDS
- ⊙ NORMALLY CLOSED VALVE



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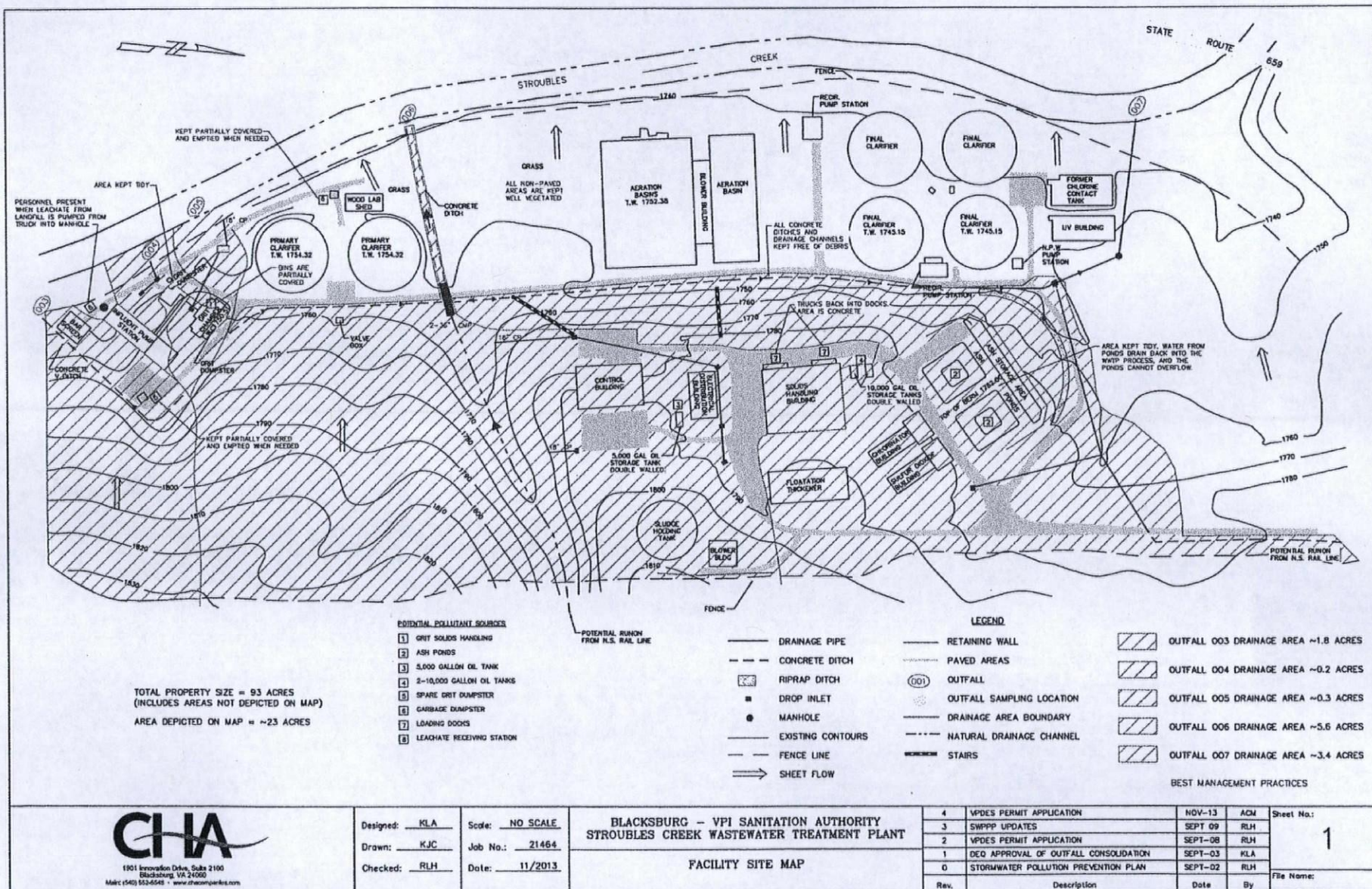
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BLACKSBURG – VPI SANITATION AUTHORITY
LOWER STROUBLES CREEK WASTEWATER
TREATMENT PLANT
SCHEMATIC FLOW DIAGRAM

PROJECT NO.
21464

DATE: DEC 2013

FIGURE 2





COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office
www.deq.virginia.gov

Doug W. Domenech
Secretary of Natural Resources

Lynchburg Office
7705 Timberlake Road
Lynchburg, Virginia 24502
(434) 582-5120
Fax (434) 582-5125

David K. Paylor
Director

Robert J. Weld
Regional Director

Roanoke Office
3019 Peters Creek Road
Roanoke, Virginia 24019
(540) 562-6700
Fax (540) 562-6725

Mr. Michael Vaught
Executive Director
Blacksburg – VPI Sanitation Authority
P.O. Drawer 52
Blacksburg, VA 24063

Re: Technical, Laboratory, and Storm Water Inspection Reports
Lower Stroubles Creek Wastewater Treatment Plant
VPDES Permit No. VA0060844

Dear Mr. Vaught:

Attached for your review are copies of the technical, laboratory, and storm water inspection reports for the Lower Stroubles Creek Wastewater Treatment Plant. I conducted the inspections on May 10, 2011.

With regard to the technical inspection, there are no recommendations for action at this time.

With regard to the laboratory inspection, no deficiencies were noted.

If you have any questions regarding these reports, please contact me at the Blue Ridge Regional Office, Roanoke (540) 562-6829).

Sincerely,

Gerald A. Duff
Compliance Inspector Senior

Attachments

Copies: S. C. Hale, file - DEQ/BRRO, Roanoke

Facility: **Blacksburg-VPI SA Lower Stroubles Creek WWTP**
County/Town: **Montgomery County**

VPDES NO. **VA0060844**

**DEPARTMENT OF ENVIRONMENTAL QUALITY – BLUE RIDGE REGIONAL OFFICE, ROANOKE
WASTEWATER FACILITY
INSPECTION REPORT
PART I**

Inspection date: **05/10/2011** Date form completed: **06/01/2011** Inspection scheduled: **Y N**
Inspection by: **Gerald A. Duff** Inspection agency: **DEQ/BRRO-R** Inspection announced: **Y N**
Time spent: **30 hours with travel**
Reviewed by: **S. C. Hale**
Present at inspection: **Bobby Epperly**

TYPE OF FACILITY:

☐ Federal ☒ Domestic ☒ Major ☐ Primary
☒ Nonfederal ☐ Industrial ☐ Minor ☒ Secondary

TYPE OF INSPECTION:

☒ Routine Date of last inspection: **01/12/2004**
☐ Compliance/Assistance/Complaint Agency: **DEQ/WCRO**
☐ Reinspection

Population served: **~ 70,000** Connections served: **Unknown**

Last month average: BOD: **145 mg/L** TSS: **128 mg/L** Flow: **7.079 MGD**
(Influent)
March 2011 Other: Temperature: **56 °F**, Settleable Solids: **5.3 mg/L**

Last month average: BOD: **1.2 mg/L** TSS: **2.8 mg/L** Flow: **6.305 MGD**
(Effluent)
March 2011 Other: pH: **6.8 – 7.4 SU**, D.O. Min: **9.0 mg/L**, TRC Cont.: **2.46 mg/L**, TRC: **0.0004 mg/L**

Quarter average: BOD: **1.3 mg/L** TSS: **3.5 mg/L** Flow: **5.258 MGD**
(Effluent)
Jan. – Mar. 2011 Other: pH: **6.8 – 7.4 SU**, D.O. Min: **9.2 mg/L**, TRC Cont.: **2.50 mg/L**, TRC: **0.001 mg/L**

DATA VERIFIED IN PREFACE

☐ Updated ☒ No changes

Has there been any new construction?

☐ Yes ☒ No

If yes, were plans and specifications approved?

☐ Yes ☐ No ☒ NA

DEQ approval date: **NA**

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of certified operators: I - 8, II - 1, III - 3, Laboratory Supervisor - 1
2. Hours per day plant is manned: 24 hours/day, 7 days/week
3. Describe adequacy of staffing. ☒ Good ☐ Average ☐ Poor
4. Does the plant have an established program for training personnel? ☒ Yes ☐ No
5. Describe the adequacy of the training program. ☒ Good ☐ Average ☐ Poor
6. Are preventive maintenance tasks scheduled? ☒ Yes ☐ No
7. Describe the adequacy of maintenance. ☒ Good ☐ Average ☐ Poor
8. Does the plant experience any organic/hydraulic overloading?
If yes, identify cause and impact on plant: NA ☒ Yes ☐ No
9. Any bypassing since last inspection? ☐ Yes ☒ No
10. Is the standby electric generator operational? ☒ Yes ☐ No ☒ NA
11. Is the STP alarm system operational? ☒ Yes ☐ No ☐ NA
12. How often is the standby generator exercised? Twice/month*
Power Transfer Switch? Once/month Alarm System? Weekly
13. When were the cross connection control devices last tested on the potable water services? 05/16-17/2011
14. Is sludge being disposed in accordance with the approved sludge disposal plan? ☒ Yes* ☐ No
15. Is septage received by the facility? ☐ Yes ☒ No
Is septage loading controlled? ☐ Yes ☐ No ☒ NA
Are records maintained? ☐ Yes ☐ No ☒ NA
16. Overall appearance of facility: ☒ Good ☐ Average ☐ Poor

Comments: 12. The facility has two generators, each capable of independently maintaining plant operational units. Each generator is exercised on-line (with a full load) once per month.

14. Fly ash is disposed at the Montgomery County Landfill.

* Responses with this symbol should be of particular concern and the investigator may want to address the problem in more detail in the Comments Section.

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?

Operational Logs for each unit process	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Instrument maintenance and calibration	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Mechanical equipment maintenance	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Industrial waste contribution (Municipal Facilities)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA

2. What does the operational log contain?

<input checked="" type="checkbox"/> Visual observations	<input checked="" type="checkbox"/> Flow measurement
<input checked="" type="checkbox"/> Laboratory results	<input checked="" type="checkbox"/> Process adjustments
<input checked="" type="checkbox"/> Control calculations	<input checked="" type="checkbox"/> Other (specify) – See below

Comments: **Ambient air temperatures and rainfall records are maintained.**

3. What do the mechanical equipment records contain?

<input checked="" type="checkbox"/> As built plans and specs	<input checked="" type="checkbox"/> Spare parts inventory
<input checked="" type="checkbox"/> Manufacturers instructions	<input checked="" type="checkbox"/> Equipment/parts suppliers
<input checked="" type="checkbox"/> Lubrication schedules	<input type="checkbox"/> Other (specify)

Comments:

4. What do the industrial waste contribution records contain (Municipal Only)?

<input checked="" type="checkbox"/> Waste characteristics	<input checked="" type="checkbox"/> Locations and discharge types
<input type="checkbox"/> Impact on plant	<input type="checkbox"/> Other (specify)

Comments:

5. Which of the following records are kept at the plant and available to personnel?

<input checked="" type="checkbox"/> Equipment maintenance records	<input checked="" type="checkbox"/> Operational Log
<input checked="" type="checkbox"/> Industrial contributor records	<input checked="" type="checkbox"/> Instrumentation records
<input checked="" type="checkbox"/> Sampling and testing records	

6. Records not normally available to plant personnel and their location: **None**

7. Were the records reviewed during the inspection? ☒ Yes* ☐ No

8. Are the records adequate and the O & M Manual current? ☒ Yes* ☐ No

9. Are the records maintained for the required 3-year time period? ☒ Yes ☐ No

Comments: 7. **Daily operational logs and laboratory records were reviewed in depth subsequent to the inspection.**

8. **The O&M manual was revised on 09/21/2005 and attested to be accurate on 09/12/2009.**

(C) SAMPLING

1. Do sampling locations appear to be capable of providing representative samples? ☒ Yes ☐ No
2. Do sample types correspond to those required by the VPDES permit? ☒ Yes ☐ No
3. Do sampling frequencies correspond to those required by the VPDES permit? ☒ Yes ☐ No
4. Are composite samples collected in proportion to flow? ☒ Yes ☐ No ☐ NA
5. Are composite samples refrigerated during collection? ☒ Yes ☐ No ☐ NA
6. Does plant maintain required records of sampling? ☒ Yes ☐ No
7. Does plant run operational control tests? ☒ Yes* ☐ No

Comments: **7. Operational control testing includes pH, Temperature, D.O., MLSS, MLVSS, Settleable Solids, SDI, SVI, and Alkalinity.**

(D) TESTING

1. Who performs the testing? ☒ Plant ☐ Central Lab ☐ Commercial Lab

Name:

If plant performs any testing, complete 2-4.

2. What method is used for chlorine analysis? **Hach Method #8167 for the chlorine contact tank and S.M., 18th Ed., #4500-Cl C for after dechlorination.**
3. Does plant appear to have sufficient equipment to perform required tests? ☒ Yes ☐ No
4. Does testing equipment appear to be clean and/or operable? ☒ Yes ☐ No

Comments:

(E) FOR INDUSTRIAL FACILITIES WITH TECHNOLOGY BASED LIMITS ONLY NA

1. Is the production process as described in the permit application? (If no, describe changes in comments)
☐ Yes ☐ No ☐ NA
2. Do products and production rates correspond as provided in the permit application? (If no, list differences)
☐ Yes ☐ No ☐ NA
3. Has the State been notified of the changes and their impact on plant effluent? Date:
☐ Yes ☐ No* ☐ NA

Comments:

Problems identified at last inspection:

There were no recommendations for action identified during the previous inspection.

SUMMARY

Recommendations for action:

There are no recommendations for action at this time.

DEPARTMENT OF ENVIRONMENTAL QUALITY – BLUE RIDGE REGIONAL OFFICE, ROANOKE
WASTEWATER FACILITY
INSPECTION REPORT
PART II

Unit Process Evaluation Summary Sheet

UNIT PROCESS	APPLICABLE	COMMENTS
SEWAGE PUMPING	X	
FLOW MEASUREMENT	X	
SCREENING/COMMINUTION	X	
GRIT REMOVAL	X	
FLOW EQUALIZATION		
PRE-AERATION		
FINE SCREENING		
OIL/WATER SEPARATOR		
PRIMARY SEDIMENTATION	X	
ACTIVATED SLUDGE AERATION	X	
TRICKLING FILTERS		
ROTATING BIOLOGICAL CONTACTORS		
SEPTIC TANK/SAND FILTER		
SECONDARY SEDIMENTATION	X	
RAPID MIX/FLOCCULATION		
TERTIARY SEDIMENTATION		
FILTRATION		
MICRO-SCREENING		
ACTIVATED CARBON ADSORPTION		
CHLORINATION	X	
NON-POTABLE WATER PUMPING	X	
DECHLORINATION	X	
OZONATION		
ULTRAVIOLET DISINFECTION		
POST AERATION	X	
LAND APPLICATION-EFFLUENT		
EFFLUENT/PLANT OUTFALL	X	The outfall was not visited due to its remote location on RAAP property.
SLUDGE PUMPING	X	
FLOTATION THICKENING (DAF)	X	
GRAVITY THICKENING		
SLUDGE HOLDING	X	
ANAEROBIC DIGESTION		
AEROBIC DIGESTION		
CENTRIFUGATION	X	
PRESSURE FILTRATION (SLUDGE)		
VACUUM FILTRATION		
DRYING BEDS		
FLY ASH PONDS	X	
INCINERATION	X	
COMPOSTING		
LAND APPLICATION-SLUDGE		

REFER TO INDIVIDUAL UNIT PROCESS EVALUATION FORMS REGARDING THE STANDARD COMMENTS

1. UNIT NEEDS ATTENTION
2. ABNORMAL INFLUENT/EFFLUENT
3. EVIDENCE OF EQUIPMENT FAILURE

4. UNAPPROVED MODIFICATION OR TEMPORARY REPAIR
5. EVIDENCE OF PROCESS UPSET

Attachment C

- **2012 Impaired Waters Report (excerpt)**
- **Receiving Stream Data – Station 9-NEW081.72**



2012 Impaired Waters

Categories 4 and 5 by DCR Watershed*

New River Basin

Fact Sheet prepared for DCR Watershed: N22*

Cause Group Code: N29R-01-PCB New River, Claytor Lake, Peak Creek, Reed Creek and Stony Creek

Location: The impairment begins at the I-77 bridge crossing the New River and extends downstream to the VAWVA State Line and includes the tributaries Peak Creek and Reed Creek as described below.

City / County: Giles Co. Montgomery Co. Pulaski Co. Radford City

Use(s): Fish Consumption

Cause(s) /

VA Category: PCB in Fish Tissue/ 5A

The Virginia Department of Health (VDH) issued a fish consumption advisory on August 6, 2001 for polychlorinated biphenyls (PCBs) for the lower portion of the New River (Rt. 114 Bridge downstream to the VA / WVA State Line - 52.0 miles) based on fish tissue collections from Carp. An Advisory extension to Claytor dam was issued 8/06/2003 (11.47 miles) recommends that no carp be consumed in these waters and no more than two meals per month of flathead and channel catfish. The VDH PCB Fish Consumption Advisory was further extended upstream on the New River (13 miles) to the I-77 Bridge to include the lower portions of Peak Creek (4.02 miles), Reed Creek (16.35 miles) and Claytor Lake (4,287 acres) on 12/02/2004. The VDH advises consumption should not exceed two meals per month for carp and smallmouth bass. The VDH level of concern is 50 parts per billion (ppb) in fish tissue.

There are eight fish tissue collection sites within the 2010 data window reporting exceedances of the WQS based 20 ppb fish tissue value (TV) (VDH 50 ppb). These data are reviewed by the VDH in making an advisory determination. A complete listing of collection sites and associated fish tissue data are available at <http://www.deq.virginia.gov/fishtissue/fishtissue.html>. A more detailed presentation of the data can also be found using an interactive mapping application at <http://gisweb.deq.state.va.us/>. The VDH Advisory information is also available via the web at <http://www.vdh.virginia.gov/Epidemiology/PublicHealthToxicology/Advisories/>.

9-SNC000.20- 2004 fish tissue finds with application of the new WQS TV for PCB (20 ppb) the addition of 3 species exceeding the new TV criterion. Rock Bass (size 16-20 cm) at 25.21, SM Bass (size 28.6-30.5 cm) at 22.13 and White sucker (1 fish) at 30.08 ppb. Stony Creek is therefore a 2010 addition based on the new WQS PCB tissue value of 20 ppb.

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-N22R_NEW01A00 / New River / The New River mainstem from the confluence of Back Creek downstream to the Watershed Boundary at the Montgomery / Giles County Line.	5A PCB in Fish Tissue		2002	2014	3.47
VAW-N22R_NEW02A00 / New River / New River mainstem from the Radford Army Arsenal Plant downstream intake near Whitethorne downstream to the confluence of Back Creek.	5A PCB in Fish Tissue		2002	2014	2.88
VAW-N22R_NEW03A00 / New River / New River mainstem from the confluence of Stroubles Creek downstream to the Radford Army Arsenal Plant downstream water intake near Whitethorne.	5A PCB in Fish Tissue		2002	2014	4.52
VAW-N22R_NEW04A00 / New River / New River mainstem from the Radford Army Arsenal Plant upstream intake/Pepper's Ferry Region POTW outfall downstream to the confluence of Stroubles Creek.	5A PCB in Fish Tissue		2002	2014	2.35



2012 Impaired Waters

Categories 4 and 5 by DCR Watershed*

New River Basin

Fact Sheet prepared for DCR Watershed: N22*

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-N22R_NEW05A00 / New River / New River mainstem from the Blacksburg /Christiansburg /VPI Authority intake at Rt. 114 downstream to the Radford Army Arsenal Plant upstream intake / Pepper's Ferry Regional POTW outfall.	5A PCB in Fish Tissue		2002	2014	1.77
VAW-N22R_NEW06A00 / New River / New River mainstem from the Watershed Boundary at the Crab Creek confluence downstream to the Blacksburg /Christiansburg /VPI Authority intake.	5A PCB in Fish Tissue		2006	2018	1.73
<hr/>					
New River, Claytor Lake, Peak Creek, Reed Creek and Stony Creek					
DCR Watershed: N22*			Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Fish Consumption					
PCB in Fish Tissue - Total Impaired Size by Water Type:					16.72

Sources:

Source Unknown

*Header Information: Location, City/County, Cause/VA Category and Narratives; describe the entire extent of the Impairment. Sizes presented are for Assessment Units (AUs) lying within the DCR Watershed boundary noted above.

Lower Stroubles Creek WWTP - VA0060844
STORET DATA

Water Shed Code	Station ID	Depth	
VAW-N18R	9-NEW081.7	0.3	
Collection Date Time	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITRATE NITROGEN, TOTAL (MG/L AS N)	HARDNESS, TOTAL (MG/L AS CACO3)
06/22/1989 11:20			58.000
06/22/1989 11:25	.070	.840	
06/05/1990 12:00			98.000
07/09/1990 12:30			78.000
08/02/1990 10:30	.000	.720	66.000
09/12/1990 10:30	.040	.520	68.000
10/04/1990 11:15	.000	.720	84.000
11/06/1990 10:20	.000	1.340	114.000
12/04/1990 11:15	.000	.700	58.000
06/04/1991 10:50	.000	1.000	72.000
08/13/1991 10:45	.050	.430	54.000
09/09/1991 10:20			54.000
10/02/1991 10:00	.050	.490	76.000
11/06/1991 10:25	.000	.400	60.000
12/04/1991 10:20	.060	.380	56.000
05/04/1992 09:45	.000	.840	68.000
07/06/1992 10:50	.040	1.130	94.000
08/10/1992 09:15	.000	.970	78.000
09/02/1992 09:15	.000	.710	78.000
10/01/1992 09:45	.040	.590	76.000
11/03/1992 09:35	.100	.480	58.000
12/02/1992 09:15	.040	.710	49.000
06/07/1993 10:00	.000	1.160	98.000
07/07/1993 09:15	.050	.840	78.000
08/02/1993 09:45	.000	.650	76.000
09/03/1993 09:35	.000	.660	72.000
10/12/1993 09:20	.040	.760	90.000
11/01/1993 09:20	.000	.670	74.000
12/02/1993 13:15	.100	.530	72.000
06/07/1994 10:00	.000	1.050	97.000
07/07/1994 10:00	.040	.710	70.000
08/04/1994 09:35	.040	.750	70.000
09/28/1994 10:30	.050	.700	62.000
10/11/1994 10:00	.000	.530	57.000
11/03/1994 09:50	.040	.360	46.000
12/07/1994 10:05	.040	.390	46.000
12/21/1994 10:30	.050	.350	40.000
06/21/1995 09:35	.000	1.250	96.000
07/13/1995 08:45			88.000
08/09/1995 08:50	.050	.560	61.000
09/13/1995 09:25	.040	.550	66.000
10/11/1995 08:25	.090	.680	62.000
11/13/1995 09:30	.070	.530	54.000
12/04/1995 09:10	.000	.510	45.000

Collection Date Time	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITRATE NITROGEN, TOTAL (MG/L AS N)	HARDNES S, TOTAL (MG/L AS CACO3)
06/12/1996 10:00	.050	.550	36.000
07/16/1996 10:10	.040	.750	64.000
08/19/1996 09:35	.110	.900	66.000
09/19/1996 09:30	.000	1.210	90.000
10/15/1996 09:05	.000	.960	85.000
11/13/1996 12:00	.000	.780	50.000
12/18/1996 09:10	.050	1.200	74.000
06/11/1997 09:00	.000	.820	64.200
07/09/1997 10:10	.000	.880	59.300
08/25/1997 09:20	.000	.200	64.100
09/25/1997 08:45	.000	.480	50.400
10/20/1997 10:10	.000	.470	67.800
11/04/1997 12:15	.150	.340	57.300
12/02/1997 09:00	.000	.640	74.000
06/04/1998 08:10	.000	1.060	78.200
07/28/1998 09:30	.000	.740	68.700
08/12/1998 11:00	.000	.940	83.300
09/01/1998 09:35	.000	.580	59.500
10/20/1998 09:30	.000	.760	92.000
11/17/1998 09:15	.090	.580	65.000
12/08/1998 09:30	.000	.490	62.000
06/22/1999 08:40	.040	.850	78.000
07/26/1999 09:30	.000	.720	77.000
08/17/1999 09:25	.000	.560	69.600
09/21/1999 09:25	.000	.390	59.300
10/13/1999 08:31	.000	.550	75.200
11/16/1999 09:10	.000	.550	69.600
12/14/1999 09:30	.100	.470	54.200
06/26/2000 09:35	.000	.550	62.000
07/26/2000 09:40	.000	.810	72.600
08/16/2000 13:35	.000	.640	72.400
09/19/2000 09:00	.000	.720	75.900
10/18/2000 10:00	.000	.590	83.400
11/29/2000 10:30	.050	.530	63.300
12/27/2000 13:00	.000	.450	65.400
06/25/2001 08:30	.000	1.310	114.000
07/17/2001 10:30	.000	.850	52.100
08/15/2001 12:50	.000	1.050	68.900
09/11/2001 09:30	.000	.720	57.600
10/25/2001 13:50	.000	.670	40.100
11/27/2001 12:00	.160	1.650	163.300
12/18/2001 13:30	.000	.620	44.500
06/25/2002 08:30	.000	.670	79.200
07/30/2002 10:50	.000	.470	74.500

Collection Date Time	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITRATE NITROGEN, TOTAL (MG/L AS N)	HARDNESS, TOTAL (MG/L AS CACO3)
08/20/2002 09:30	.060	.350	62.100
09/19/2002 09:45	.050	.510	101.000
10/31/2002 09:20	.050	.560	68.700
11/20/2002 12:30	.050	1.560	106.000
12/12/2002 14:15	.000	1.020	69.100
06/12/2003 09:00	.000	1.340	103.000
08/10/2005 10:00	.000		
10/27/2005 09:40	.000		
12/19/2005 10:45	.040		
06/08/2006 09:50	.130		
08/14/2006 10:45	.000		
10/05/2006 09:30	.000		
12/14/2006 09:30	.040		
02/08/1989 11:40			60.000
03/21/1989 11:10			56.000
03/21/1989 11:15	.080	.810	
04/18/1989 12:15			60.000
04/18/1989 12:20	.000	.740	
05/16/1989 13:45			72.000
05/16/1989 13:50	.000	.870	
01/28/1991 11:15	.040	.980	62.000
02/07/1991 10:10			68.000
03/12/1991 11:00	.000	.690	56.000
04/08/1991 10:45	.050	1.040	74.000
05/06/1991 10:40	.050	.830	68.000
01/08/1992 10:05	.060	.760	52.000
02/06/1992 11:00	.000	.880	
04/09/1992 09:00	.000	.820	62.000
05/11/1992 10:10	.080	.920	60.000
01/06/1993 09:30	.080	.880	54.000
02/03/1993 12:45	.050	.980	60.000
03/02/1993 12:20	.000	.980	60.000
04/06/1993 09:30	.060	1.290	82.000
05/04/1993 09:45	.000	1.050	80.000
01/26/1994 10:10	.050	1.180	82.000
02/03/1994 09:15	.050	1.400	118.000
03/28/1994 09:10	.050	2.170	176.000
04/07/1994 09:20	.070	1.460	101.000
05/03/1994 09:15	.000	1.350	93.000
01/24/1995 09:30	.160	.940	45.000
02/27/1995 09:55	.060	1.020	65.000
03/29/1995 10:35	.000	1.200	84.000
04/20/1995 08:25			88.000
05/24/1995 08:20	.000	.850	73.000

Collection Date Time	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITRATE NITROGEN, TOTAL (MG/L AS N)	HARDNESS , TOTAL (MG/L AS CACO3)
01/04/1996 09:00	.000	.610	50.000
02/22/1996 08:05	.040	1.500	86.000
03/14/1996 09:45	.000	1.140	82.000
04/15/1996 08:05	.000	1.100	86.000
05/14/1996 11:00	.060	.480	36.000
01/22/1997 08:30	.000	.950	57.700
02/12/1997 09:45	.200	1.160	77.200
03/25/1997 08:40	.000	1.170	84.600
04/16/1997 09:55	.060	1.180	86.800
05/28/1997 08:25	.000	.610	48.200
01/22/1998 08:30	.080	.760	62.400
02/12/1998 09:00	.040	1.370	91.000
03/19/1998 08:15	.000	1.330	102.000
04/15/1998 08:50	.000	1.220	81.000
05/11/1998 10:00	.000	1.570	128.000
01/28/1999 08:15	.000	.870	154.000
02/10/1999 08:10	.050	.960	76.000
03/30/1999 09:05	.000	.870	60.000
04/26/1999 08:50	.000	.960	126.000
05/10/1999 08:20	.000	.750	62.000
01/26/2000 09:15	.000	1.880	65.100
02/14/2000 09:00	.000	.750	60.900
03/29/2000 12:00	.000	.910	61.000
04/06/2000 09:15	.000	.930	59.000
05/24/2000 09:05	.000	1.050	92.000
01/17/2001 11:30	.000	.690	75.300
02/06/2001 11:00	.000	1.720	155.000
03/08/2001 10:00	.000	.620	28.100
04/10/2001 10:15	.050	.980	73.400
05/17/2001 09:00	.000	1.280	112.000
01/23/2002 10:05	.000	.470	67.800
02/25/2002 14:00	.000	.880	47.000
03/18/2002 13:00	.040	1.250	109.000
04/30/2002 10:30	.000	.960	81.200
05/30/2002 09:15	.000	.830	89.300
01/22/2003 14:15	.000	1.370	93.800
02/11/2003 08:55	.000	1.080	73.400
03/10/2003 12:30	.050	1.660	91.400
04/10/2003 09:30	.000	2.110	178.000
02/21/2006 10:00	.000		
04/06/2006 09:00	.000		
Average	0.025	0.885	74.7

Water Shed Code	Station	Depth	
VAWN-18R	9-NEW	0.3	
Collection Date Time	Hi-Flow Month	Temp Celcius	Field Ph
06/22/1989 11:20	0	20.9	8.4
06/05/1990 12:00	0	17.9	7.8
07/09/1990 12:30	0	28.2	8.1
08/02/1990 10:30	0	21.9	8.2
09/12/1990 10:30	0	22.9	7.9
10/04/1990 11:15	0	19.3	8
11/06/1990 10:20	0	11.7	8.6
12/04/1990 11:15	0	8.5	8.8
06/04/1991 10:50	0	20.3	8.2
08/13/1991 10:45	0	23.3	8
09/09/1991 10:20	0	21.8	7.65
10/02/1991 10:00	0	18.4	8
11/06/1991 10:25	0	12.1	8.3
12/04/1991 10:20	0	9.9	8.5
06/04/1992 09:45	0	15.6	8.2
07/06/1992 10:50	0	20.1	8.2
08/10/1992 09:15	0	22.3	7.7
09/02/1992 09:15	0	21	7.6
10/01/1992 09:45	0	17.6	7.9
11/03/1992 09:35	0	14.2	7.6
12/02/1992 09:15	0	8.4	8.5
06/07/1993 10:00	0	17.4	8.1
07/07/1993 09:15	0	21.5	7.7
08/02/1993 09:45	0	22.5	7.5
09/01/1993 09:35	0	23.6	7.6
10/12/1993 09:20	0	16	7.9
11/01/1993 09:20	0	13.4	8.3
12/02/1993 13:15	0	9.7	7.9
06/07/1994 10:00	0	18.4	7.7
07/07/1994 10:00	0	22.1	7.74
08/04/1994 09:35	0	23	7.6
09/28/1994 10:30	0	19	7.98
10/11/1994 10:00	0	17	7.83
11/03/1994 09:50	0	13.4	7.91
12/07/1994 10:05	0	9.9	8.1
12/21/1994 10:30	0	6.4	9
06/21/1995 09:35	0	19	7.95
07/13/1995 08:45	0	20	7.71
08/09/1995 08:50	0	22.7	7.36
09/13/1995 09:25	0	22.6	7.56
10/11/1995 08:25	0	17.5	7.85
11/13/1995 09:30	0	10.8	8.25
12/04/1995 09:10	0	8.1	8.22
06/12/1996 10:00	0	20.4	8.11
07/16/1996 10:10	0	23.1	7.91
08/19/1996 09:35	0	19.9	7.86

Lower Stroubles Creek WWTP - VA0060844
STORET DATA - Temperature and pH

Collection Date Time	Hi-Flow Month	Temp Celcius	Field Ph
09/19/1996 09:30	0	18.5	8.19
10/15/1996 09:05	0	15	8.25
11/13/1996 12:00	0	10.9	8.15
12/18/1996 09:10	0	6.8	8.23
06/11/1997 09:00	0	15.5	7.93
08/25/1997 09:20	0	21.7	7.49
09/25/1997 08:45	0	19.2	7.56
10/20/1997 10:10	0	15.6	8.22
11/04/1997 12:15	0	13.9	7.77
12/02/1997 09:00	0	7	7.81
06/04/1998 08:10	0	19	7.84
07/28/1998 09:30	0	23.4	7.78
08/12/1998 11:00	0	23.4	7.79
09/01/1998 09:35	0	23.3	7.73
10/20/1998 09:30	0	17.1	7.98
11/17/1998 09:15	0	12.8	7.78
12/08/1998 09:30	0	12.4	7.38
06/22/1999 08:40	0	18.5	7.92
07/26/1999 09:30	0	22.5	7.9
08/17/1999 09:25	0	23	7.71
09/21/1999 09:25	0	19.1	7.9
10/13/1999 08:31	0	16.9	7.84
11/16/1999 09:10	0	9	7.51
06/26/2000 09:35	0	20.9	7.68
07/26/2000 09:40	0	20.6	7.55
08/16/2000 13:35	0	23.7	7.63
09/19/2000 09:00	0	19.1	7.49
10/18/2000 10:00	0	16.2	7.71
11/29/2000 10:30	0	8.5	8.01
12/27/2000 13:00	0	6.5	8.3
06/25/2001 08:30	0	17.3	7.27
07/17/2001 10:30	0	21.8	8.1
08/15/2001 12:50	0	22.1	7.61
09/11/2001 09:30	0	21.4	7.72
10/25/2001 13:50	0	17.5	8.33
12/18/2001 13:30	0	10.6	8.48
06/25/2002 08:30	0	19.79	7.28
07/30/2002 10:50	0	23.08	7.23
08/20/2002 09:30	0	22.9	7.23
09/19/2002 09:45	0	21.75	7.61
10/31/2002 09:20	0	13.2	7.13
11/20/2002 12:30	0	10.55	7.6
12/12/2002 14:15	0	7.02	7.64
06/12/2003 09:00	0	17.26	7.79
08/19/2003 10:05	0	22.46	7.37
10/27/2003 13:00	0	14.41	7.72

Collection Date Time	Hi-Flow Month	Temp Celcius	Field Ph
12/22/2003 10:30	0	8.2	7.6
06/22/2004 09:30	0	20.9	7.47
08/25/2004 12:30	0	23.3	7.63
10/27/2004 09:45	0	14.3	7.1
12/01/2004 10:30	0	11.11	7.45
06/07/2005 10:00	0	17.7	7.8
08/10/2005 10:00	0	24	7.2
10/27/2005 09:40	0	13.1	7.8
12/19/2005 10:45	0	5.4	7.5
06/08/2006 09:50	0	17.6	7
08/14/2006 10:45	0	23.2	7.6
10/05/2006 09:30	0	18.9	7.2
12/14/2006 09:30	0	6.2	8.2
07/17/2007 12:15	0	23.1	7.7
09/27/2007 10:00	0	22.2	8.2
11/29/2007 10:30	0	9.7	8.1
07/02/2008 13:15	0	21.1	7.5
09/10/2008 14:20	0	21.5	8.2
11/19/2008 12:30	0	9.6	8.3
07/21/2009 15:00	0	21.6	8.5
09/21/2009 12:20	0	20.8	8.2
11/17/2009 15:00	0	11.6	8.1
07/20/2010 15:10	0	24.6	8
09/02/2010 14:35	0	26.1	8
10/25/2010 09:15	0	16.2	7.3
11/18/2010 13:50	0	12	8.2
07/19/2011 09:45	0	23.4	7.8
09/15/2011 11:15	0	20.5	8.5
11/29/2011 11:00	0	10.2	8.2
06/19/2012 10:30	0	21	7.8
08/22/2012 11:10	0	21.9	7.9
10/17/2012 11:30	0	14.3	8.3
12/12/2012 11:10	0	6.6	7.3
07/11/2013 09:50	0	21.19	7.37
07/30/2013 14:10	0	21.5	7.5
09/18/2013 11:30	0	20.1	7.7
11/18/2013 13:25	0	12.4	7.9
12/02/2013 12:00	0	7.4	7.5
02/08/1989 11:40	1	5.1	8.8
03/21/1989 11:10	1	6.7	8.6
04/18/1989 12:15	1	13	8.2
05/16/1989 13:45	1	14	8.3
01/28/1991 11:15	1	6	8.8
02/07/1991 10:10	1	6.3	8.5
03/12/1991 11:00	1	6.7	7.3
04/08/1991 10:45	1	12.9	8.3

Collection Date Time	Hi-Flow Month	Temp Celcius	Field Ph
05/06/1991 10:40	1	16.1	8.2
01/08/1992 10:05	1	5.8	8.5
04/09/1992 09:00	1	7.7	8.6
05/11/1992 10:10	1	13.5	8.3
01/06/1993 09:30	1	5.7	8
02/03/1993 12:45	1	5.8	8
03/02/1993 12:20	1	5.3	8.2
04/06/1993 09:30	1	8.9	8
05/04/1993 09:45	1	12.8	8.1
01/26/1994 10:10	1	3.9	8.3
02/03/1994 09:15	1	3.3	8.4
03/28/1994 09:10	1	11.3	7.9
04/07/1994 09:20	1	9.5	8.1
05/03/1994 09:15	1	14.2	8
01/24/1995 09:30	1	7.2	8.36
02/27/1995 09:55	1	4.4	8.5
03/29/1995 10:35	1	11.3	8.51
04/20/1995 08:25	1	12.4	7.93
05/24/1995 08:20	1	15.8	7.72
01/04/1996 09:00	1	3.1	8.71
02/22/1996 08:05	1	6.1	8.1
03/14/1996 09:45	1	6.5	8.52
04/15/1996 08:05	1	10.6	8.35
05/14/1996 11:00	1	15	7.7
01/22/1997 08:30	1	3.8	8.36
02/12/1997 09:45	1	4.2	8.42
03/25/1997 08:40	1	9.8	8.17
04/16/1997 09:55	1	11.9	8.28
05/28/1997 08:25	1	15.4	8.01
01/22/1998 08:30	1	6	7.65
02/12/1998 09:00	1	5.5	8.23
03/19/1998 08:15	1	7.9	8
04/15/1998 08:50	1	12.4	7.71
05/11/1998 10:00	1	14.1	8.04
01/28/1999 08:15	1	6.4	7.89
02/10/1999 08:10	1	6.3	8.16
03/30/1999 09:05	1	8.1	8.51
04/26/1999 08:50	1	12.5	8.18
05/10/1999 08:20	1	13.8	8.2
01/26/2000 09:15	1	1.9	7.52
02/14/2000 09:00	1	4.3	7.61
03/29/2000 12:00	1	11.4	7.94
04/06/2000 09:15	1	10.6	7.99
05/24/2000 09:05	1	16.3	7.9
01/17/2001 11:30	1	3.3	8.21
02/06/2001 11:00	1	8.2	8.4

Collection Date Time	Hi-Flow Month	Temp Celcius	Field Ph
03/08/2001 10:00	1	6.1	8.49
04/10/2001 10:15	1	13.1	7.89
05/17/2001 09:00	1	13.5	8.09
01/23/2002 10:05	1	6	8.01
02/25/2002 14:00	1	8.1	8.24
03/18/2002 13:00	1	8.5	8.09
04/30/2002 10:30	1	13.59	7.72
05/30/2002 09:15	1	16.98	7.58
01/22/2003 14:15	1	4.93	8.05
02/11/2003 08:55	1	3.1	8.23
03/10/2003 12:30	1	8.27	7.93
04/10/2003 09:30	1	10.56	8.12
02/18/2004 10:15	1	5.14	7.75
04/21/2004 15:55	1	13.73	7.59
02/17/2005 09:30	1	4.63	8.06
04/19/2005 09:10	1	12.08	8.11
02/21/2006 10:00	1	5.1	7.8
04/06/2006 09:00	1	9.2	6.8
01/17/2007 12:15	1	7.1	8
03/20/2007 09:15	1	8.8	8.2
05/09/2007 12:25	1	14.8	8.3
01/23/2008 10:30	1	5.6	8
03/05/2008 11:00	1	5.9	8.1
05/15/2008 13:45	1	16.4	8
01/22/2009 14:50	1	5.5	8.2
03/10/2009 12:25	1	7.1	8.2
05/12/2009 10:30	1	15.1	6.8
01/28/2010 12:40	1	8.9	8.2
03/24/2010 15:00	1	11.2	8.3
05/18/2010 09:00	1	16.7	7.4
05/26/2010 14:45	1	20.1	8.3
01/20/2011 10:00	1	1.7	8.4
03/24/2011 10:05	1	10	7.9
05/11/2011 10:30	1	16.7	8.3
05/18/2011 08:22	1	15.6	7.5
01/25/2012 12:15	1	5.3	8.2
04/03/2012 10:45	1	13	8.2
01/15/2013 14:35	1	6.4	7.3
03/07/2013 14:05	1	4.7	7.6
05/23/2013 12:35	1	16.5	7.7
90th %ile Wet Season		15.54	
90th %ile Annual		22.5	8.4
10th %ile Annual			7.48
Average			

Attachment D

- **Effluent Data Summary**
- **Wasteload Allocation Spreadsheet**
- **Reasonable Potential Analysis**
- **Dissolved Oxygen Model Calculations**

Lower Stroubies Creek WWTP - VA0060844
DMR Data

Due Date	BOD5-avg	BOD5-max	TRC-avg	TRC-max	DO-min	Ecol-Avg	Flow-Avg	Flow-Max	pH-min	pH-max	ph10(est)	ph90(est)	TSS-Avg	TSS-Max
10-Jun-2009	1.4	5.5	0	0	7.8		6.314	9.807	6.5	7.2	6.6	7.1	4.8	6.3
10-Jul-2009	1.8	0	0	2	7.6		5.811	10.886	6.8	7.4	6.9	7.3	5.5	7.5
10-Aug-2009	1.4	0	0.002	0.006	7	1	4.473	6.403	6.8	7.3	6.9	7.2	2.7	3.4
10-Sep-2009	0	0	0.001	0.002	7	1	4.775	5.639	7	7.4	7.1	7.3	2.8	2.9
10-Oct-2009	0	0	0.004	0.005	7	4	4.832	7.423	6.8	7.1	6.8	7.1	3.4	3.8
10-Nov-2009	0	0	0.002	0.005	7.2	2	5.141	6.584	6.8	7.1	6.8	7.1	5.2	6.7
10-Dec-2009	1.5	6	0.002	0.003	7.2	25	6.072	15.574	6.8	7.4	6.9	7.3	6.1	8.3
10-Jan-2010	0	0	0	0.003	7.7	1	7.167	15.426	6.9	7.4	7.0	7.3	4.4	4.5
10-Feb-2010	1.3	5.2	0	0	8.4	1	6.545	15.025	7	7.4	7.1	7.3	3.3	4.3
10-Mar-2010	1.3	5.2	0.001	0	8.5	1	6.806	8.797	6.9	7.2	6.9	7.2	3.6	6.1
10-Apr-2010	1.4	0	0	0	9	1	6.796	10.648	6.9	7.2	6.9	7.2	4	3.7
10-May-2010	6.2	11.3	0	0	7.6	1	5.793	6.772	6.7	7.3	6.8	7.2	5.9	12.3
10-Jun-2010	4.2	10.9	0.003	0.007	7.6	1	4.691	5.511	6.6	7.4	6.7	7.3	5.7	9.3
10-Jul-2010	0	0	0.003	0.008	7	7	4.245	4.909	6.8	7.2	6.9	7.1	3.1	4
10-Aug-2010	0	0	0.002	0.004	7	1	4.109	6.091	6.8	7.3	6.9	7.2	3	4.2
10-Sep-2010	0	0	0.001	0.003	7	1	4.884	6.614	6.8	7.2	6.9	7.1	4.4	6.6
10-Oct-2010	0	0	0.001	0.006	7	1	5.019	6.497	6.8	6.9	6.6	6.9	4.8	6.9
10-Nov-2010	2	8.1	0	0.002	7.2	1	5.032	6.01	6.4	7	6.5	6.9	4.6	5.9
10-Dec-2010	0	0	0	0.001	7.6	4	4.743	6.851	6.5	7.3	6.6	7.2	3.2	3.7
10-Jan-2011	0	0	0.003	0.009	8.2	1	4.683	10.736	6.7	7.4	6.8	7.3	3.6	4.2
10-Feb-2011	0	0	0.002	0.004	9.3	1	4.389	5.128	6.9	7.3	7.0	7.2	4.2	6.1
10-Mar-2011	2.7	5.4	0.001	0.003	9.4	1	5.08	7.814	6.8	7.3	6.9	7.2	3.5	4.4
10-Apr-2011	1.2	0	0	0.002	9	1	6.305	10.327	6.8	7.4	6.9	7.3	2.8	3.9
10-May-2011	1.4	5.5	0	0	8.4	1	6.502	9.939	6.8	7.1	6.9	7.1	3.7	6.6
10-Jun-2011	0	0	0	0	8	1	5.921	9.945	6.8	7.5	6.9	7.4	3	5.7
10-Jul-2011	0	0	0	0	7	1	4.156	5.031	7	7.7	7.1	7.6	2	2.7
10-Aug-2011	0	0	0	0	7	1	3.786	5.5	7.1	7.3	7.1	7.3	2.7	4.2
10-Sep-2011	0	0	0.001	0.002	7.1	1	3.868	4.574	6.8	7.4	6.9	7.3	3.4	5.2
10-Oct-2011	0	0	0.001	0.003	7.1	2	4.841	9.335	6.6	7.2	6.7	7.1	1.8	2.2
10-Nov-2011	0	0	0	0	7.5	7	5.083	6.403	6.6	7	6.7	6.9	1.8	2.1
10-Dec-2011	0	0	0	0	7.7	1	4.938	8.824	6.7	7.2	6.8	7.1	1.9	2.1
10-Jan-2012	1.3	5.2	0	0.002	8.1	1	5.259	10.137	6.7	7.5	6.8	7.4	2.5	3.6
10-Feb-2012	1.3	5	0	0	9	1	5.072	6.426	6.8	7.3	6.9	7.2	2.7	3
10-Mar-2012	9.1	12.9	0	0	8	2	5.728	8.546	6.8	7.4	6.9	7.3	8.4	13.3
10-Apr-2012	7.2	11.5	0	0	7.5	1	6.132	9.318	7	7.3	7.0	7.3	5.2	7.4
10-May-2012	2.8	5.7	0	0	7.2	1	5.816	8.975	6.7	7.3	6.8	7.2	4.1	5.2
10-Jun-2012	1.4	0	0	0	7.8	1	4.936	6.064	6.5	7.2	6.6	7.1	2	2.3
10-Jul-2012	0	0	0	0	7.1	1	4.381	5.558	6.7	7.1	6.8	7.0	2.2	2.5
10-Aug-2012	0	0	0	0	6.9	5	4.231	4.928	6.7	7	6.7	7.0	2.6	3.8
10-Sep-2012	1	0	0	0	6.8	28	4.811	6.223	6.7	7.3	6.8	7.2	3.3	4.3
10-Oct-2012	0	0	0	0	7.1	1	4.857	6.952	6.6	7	6.7	6.9	3	3.6
10-Nov-2012	1	0	0	0	7.2	1	4.481	5.095	6.7	7.3	6.8	7.2	2.5	3.1
10-Dec-2012	1.3	5.2	0	0	7.1	1	4.646	5.65	6.7	7.2	6.8	7.1	3.1	3.5
10-Jan-2013	0	0	0	0	8.2	1	4.641	5.31	6.7	7.3	6.8	7.2	2.6	3.7
10-Feb-2013	3.9	6.8	0	0	8.2	10	6.319	14.75	7	7.3	7.0	7.3	3.5	4.6
10-Mar-2013	6.8	8.1	0	0	8	11	6.669	9.186	6.8	7.4	6.9	7.3	4.3	5.8
10-Apr-2013	6.8	8.6	0	0	7.5	2	5.422	6.787	6.8	7.3	6.9	7.2	4.4	4.4
10-May-2013	8.5	8.2	0	0	7.2	2	5.86	8.375	6.9	7.5	7.0	7.4	7.7	6.9
10-Jun-2013	4.9	9.3	0	0	7.1	3	6.424	11.577	7	7.4	7.1	7.3	3.1	5.9
10-Jul-2013	0	0	0	0	7.9	1	6.183	9.945	7.2	7.6	7.3	7.5	3.6	5.2
10-Aug-2013	6	7.2			7.8	8	6.781	17.357	7.4	7.9	7.5	7.8	4.6	6
10-Sep-2013	0	0			7.4	3	4.879	6.6	7.4	7.8	7.5	7.7	2.2	3.2
10-Oct-2013	0	0			7.1	11	4.767	5.558	7.1	7.8	7.2	7.7	3.3	6.4
10-Nov-2013	0	0			7.2	11	4.715	6.851	7.1	7.6	7.2	7.5	1.8	2.3
10-Dec-2013	0	0			7.7	3	4.535	6.963	7	7.6	7.1	7.5	2.1	2.7
10-Jan-2014	0	0			8.8	2	5.783	11.376	7.2	7.8	7.3	7.7	3	3.9
10-Feb-2014	0	0			7.4	2	5.415	6.318	7.2	7.7	7.3	7.6	3.4	4.3
10-Mar-2014	4.2	5.5			7.8	2	7.062	12.185	7	7.4	7.1	7.3	6.5	7.6
10-Apr-2014	5.9	6.5			8.2	1.5	5.864	8.483	7.2	7.6	7.3	7.5	3.9	4.8
Avg	1.7	2.9	0.001	0.042	7.6	3.3	5.330	8.246	6.8	7.3	6.9	7.3	3.7	5.0

Date	Hardness
10/1/2009	150
9/27/2010	118
10/11/2011	144
10/16/2012	113
10/15/2013	156
Average	136.2

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Lower Troubles Creek WWTP (VA0060844)

Permit No.: VA0060844

Receiving Stream: New River

Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO₃) = 74.7 mg/L
 90% Temperature (Annual) = 22.5 deg C
 90% Temperature (Wet season) = 15.5 deg C
 90% Maximum pH = 8.4 SU
 10% Maximum pH = 7.5 SU
 Tier Designation (1 or 2) = 2
 Public Water Supply (PWS) Y/N? = y
 Trout Present Y/N? = n
 Early Life Stages Present Y/N? = y

Stream Flows

1Q10 (Annual) = 451 MGD
 7Q10 (Annual) = 563 MGD
 3DQ10 (Annual) = 651 MGD
 1Q10 (Wet season) = 534 MGD
 3DQ10 (Wet season) = 1076 MGD
 30Q5 = 737 MGD
 Harmonic Mean = 1533 MGD

Mixing Information

Annual - 1Q10 Mix = 5.41 %
 - 7Q10 Mix = 100 %
 - 30Q10 Mix = 100 %
 Wet Season - 1Q10 Mix = 100 %
 - 30Q10 Mix = 100 %

Effluent Information

Mean Hardness (as CaCO₃) = 136.2 mg/L
 90% Temp (Annual) = 22.5 deg C
 90% Temp (Wet season) = 15.5 deg C
 90% Maximum pH = 7.3 SU
 10% Maximum pH = 6.9 SU
 Discharge Flow = 9 MGD

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acephenanthrene	0	--	--	6.7E+02	9.9E+02	--	--	5.6E+04	8.2E+04	--	--	6.7E+01	9.9E+01	--	--	5.6E+03	8.2E+03	--	--	6.6E+03	8.2E+03
Acrolein	0	--	--	6.1E+00	9.3E+00	--	--	5.1E+02	7.7E+02	--	--	6.1E-01	9.3E-01	--	--	5.1E+01	7.7E+01	--	--	6.1E+01	7.7E+01
Acrylonitrile ^c	0	--	--	5.1E-01	2.5E+00	--	--	8.7E+01	4.3E+02	--	--	5.1E-02	2.5E-01	--	--	8.7E+00	4.3E+01	--	--	8.7E+00	4.3E+01
Aldrin ^c	0	3.0E+00	--	4.9E-04	5.0E-04	1.1E+01	--	8.4E-02	8.6E-02	7.5E-01	--	4.9E-05	5.0E-05	3.8E+01	--	8.4E-03	8.6E-03	1.1E+01	--	8.4E-03	8.6E-03
Ammonia-N (mg/l) (Yearly)	0.025	1.25E+01	8.58E-01	--	--	4.62E+01	6.11E+01	--	--	1.17E+00	2.33E-01	--	--	5.86E+01	1.53E+01	--	--	4.62E+01	1.53E+01	--	--
Ammonia-N (mg/l) (High Flow)	0.025	4.50E+00	1.29E+00	--	--	2.70E+02	1.53E+02	--	--	1.14E+00	3.42E-01	--	--	6.76E+01	3.83E+01	--	--	6.76E+01	3.83E+01	--	--
Anthracene	0	--	--	8.3E+03	4.0E+04	--	--	6.9E+05	3.3E+06	--	--	8.3E+02	4.0E+03	--	--	6.9E+04	3.3E+05	--	--	6.9E+04	3.3E+05
Antimony	0	--	--	5.6E+00	6.4E+02	--	--	4.6E+02	5.3E+04	--	--	5.6E-01	6.4E+01	--	--	4.6E+01	5.3E+03	--	--	4.6E+01	5.3E+03
Arsenic	0	3.4E+02	1.5E+02	1.0E+01	--	1.3E+03	9.5E+03	8.3E+02	--	8.5E+01	3.8E+01	1.0E+00	--	4.3E+03	2.4E+03	8.3E+01	--	1.3E+03	2.4E+03	8.3E+01	--
Barium	0	--	--	2.0E+03	--	--	--	1.7E+05	--	--	--	2.0E+02	--	--	--	1.7E+04	--	--	--	1.7E+04	--
Benzene ^c	0	--	--	2.2E+01	5.1E+02	--	--	3.8E+03	8.7E+04	--	--	2.2E+00	5.1E+01	--	--	3.8E+02	8.7E+03	--	--	3.8E+02	8.7E+03
Benzidine ^c	0	--	--	8.6E-04	2.0E-03	--	--	1.5E-01	3.4E-01	--	--	8.6E-05	2.0E-04	--	--	1.5E-02	3.4E-02	--	--	1.5E-02	3.4E-02
Benzo (a) anthracene ^c	0	--	--	3.8E-02	1.8E-01	--	--	6.5E+00	3.1E+01	--	--	3.8E-03	1.8E-02	--	--	6.5E-01	3.1E+00	--	--	6.5E-01	3.1E+00
Benzo (b) fluoranthene ^c	0	--	--	3.8E-02	1.8E-01	--	--	6.5E+00	3.1E+01	--	--	3.8E-03	1.8E-02	--	--	6.5E-01	3.1E+00	--	--	6.5E-01	3.1E+00
Benzo (k) fluoranthene ^c	0	--	--	3.8E-02	1.8E-01	--	--	6.5E+00	3.1E+01	--	--	3.8E-03	1.8E-02	--	--	6.5E-01	3.1E+00	--	--	6.5E-01	3.1E+00
Benzo (a) pyrene ^c	0	--	--	3.8E-02	1.8E-01	--	--	6.5E+00	3.1E+01	--	--	3.8E-03	1.8E-02	--	--	6.5E-01	3.1E+00	--	--	6.5E-01	3.1E+00
Bis(2-Chloroethyl) Ether ^c	0	--	--	3.0E-01	5.3E+00	--	--	5.1E+01	9.1E+02	--	--	3.0E-02	5.3E-01	--	--	5.1E+00	9.1E+01	--	--	5.1E+00	9.1E+01
Bis(2-Chloroisopropyl) Ether	0	--	--	1.4E+03	6.5E+04	--	--	1.2E+05	5.4E+06	--	--	1.4E+02	6.5E+03	--	--	1.2E+04	5.4E+05	--	--	1.2E+04	5.4E+05
Bis 2-Ethylhexyl Phthalate ^c	0	--	--	1.2E+01	2.2E+01	--	--	2.1E+03	3.8E+03	--	--	1.2E+00	2.2E+00	--	--	2.1E+02	3.8E+02	--	--	2.1E+02	3.8E+02
Bromofom ^c	0	--	--	4.3E+01	1.4E+03	--	--	7.4E+03	2.4E+05	--	--	4.3E+00	1.4E+02	--	--	7.4E+02	2.4E+04	--	--	7.4E+02	2.4E+04
Butylbenzylphthalate	0	--	--	1.5E+03	1.9E+03	--	--	1.2E+05	1.6E+05	--	--	1.5E+02	1.9E+02	--	--	1.2E+04	1.6E+04	--	--	1.2E+04	1.6E+04
Cadmium	0	3.5E+00	9.1E-01	5.0E+00	--	1.3E+01	5.8E+01	4.1E+02	--	7.2E-01	2.3E-01	5.0E-01	--	3.7E+01	1.4E+01	4.1E+01	--	1.3E+01	1.4E+01	4.1E+01	--
Carbon Tetrachloride ^c	0	--	--	2.3E+00	1.8E+01	--	--	3.9E+02	2.7E+03	--	--	2.3E-01	1.6E+00	--	--	3.9E+01	2.7E+02	--	--	3.9E+01	2.7E+02
Chlordane ^c	0	2.4E+00	4.3E-03	8.0E-03	8.1E-03	6.9E+00	2.7E-01	1.4E+00	1.4E+00	6.0E-01	1.1E-03	8.0E-04	8.1E-04	3.1E+01	6.8E-02	1.4E-01	1.4E-01	8.9E+00	6.8E-02	1.4E-01	1.4E-01
Chloride	0	8.6E+05	2.3E+05	2.5E+05	--	3.2E+06	1.5E+07	2.1E+07	--	2.2E+05	5.8E+04	2.5E+04	--	1.1E+07	3.7E+06	2.1E+06	--	3.2E+06	3.7E+06	2.1E+06	--
TRC	0	1.9E+01	1.1E+01	--	--	7.1E+01	7.0E+02	--	--	4.8E+00	2.8E+00	--	--	2.4E+02	1.7E+02	--	--	7.1E+01	1.7E+02	--	--
Chlorobenzene	0	--	--	1.3E+02	1.6E+03	--	--	1.1E+04	1.3E+05	--	--	1.3E+01	1.6E+02	--	--	1.1E+03	1.3E+04	--	--	1.1E+03	1.3E+04

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane ^c	0	--	--	4.0E+00	1.3E+02	--	--	6.9E+02	2.2E+04	--	--	4.0E-01	1.3E+01	--	--	6.9E+01	2.2E+03	--	--	6.9E+01	2.2E+03
Chloroform	0	--	--	3.4E+02	1.1E+04	--	--	2.8E+04	9.1E+05	--	--	3.4E+01	1.1E+03	--	--	2.8E+03	9.1E+04	--	--	2.8E+03	9.1E+04
2-Chloronaphthalene	0	--	--	1.0E+03	1.6E+03	--	--	8.3E+04	1.3E+05	--	--	1.0E+02	1.6E+02	--	--	8.3E+03	1.3E+04	--	--	8.3E+03	1.3E+04
2-Chlorophenol	0	--	--	8.1E+01	1.5E+02	--	--	6.7E+03	1.2E+04	--	--	8.1E+00	1.5E+01	--	--	6.7E+02	1.2E+03	--	--	6.7E+02	1.2E+03
Chlorpyrifos	0	8.3E-02	4.1E-02	--	--	3.1E-01	2.6E+00	--	--	2.1E-02	1.0E-02	--	--	1.1E+00	6.5E-01	--	--	3.1E-01	6.5E-01	--	--
Chromium III	0	5.3E+02	5.9E+01	--	--	2.0E+03	3.7E+03	--	--	1.1E+02	1.5E+01	--	--	5.8E+03	9.4E+02	--	--	2.0E+03	9.4E+02	--	--
Chromium VI	0	1.6E+01	1.1E+01	--	--	5.9E+01	7.0E+02	--	--	4.0E+00	2.8E+00	--	--	2.0E+02	1.7E+02	--	--	5.9E+01	1.7E+02	--	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	8.3E+03	--	--	--	1.0E+01	--	--	--	8.3E+02	--	--	--	8.3E+02	--
Chrysene ^c	0	--	--	3.8E-03	1.8E-02	--	--	6.5E-01	3.1E+00	--	--	3.8E-04	1.8E-03	--	--	6.5E-02	3.1E-01	--	--	6.5E-02	3.1E-01
Copper	0	1.2E+01	7.1E+00	1.3E+03	--	4.8E+01	4.5E+02	1.1E+05	--	2.6E+00	1.8E+00	1.3E+02	--	1.3E+02	1.1E+02	1.1E+04	--	4.6E+01	1.1E+02	1.1E+04	--
Cyanide, Free	0	2.2E+01	5.2E+00	1.4E+02	1.6E+04	8.2E+01	3.3E+02	1.2E+04	1.3E+06	5.5E+00	1.3E+00	1.4E+01	1.6E+03	2.8E+02	8.3E+01	1.2E+03	1.3E+05	8.2E+01	8.3E+01	1.2E+03	1.3E+05
DDD ^c	0	--	--	3.1E-03	3.1E-03	--	--	5.3E-01	5.3E-01	--	--	3.1E-04	3.1E-04	--	--	5.3E-02	5.3E-02	--	--	5.3E-02	5.3E-02
DDE ^c	0	--	--	2.2E-03	2.2E-03	--	--	3.8E-01	3.8E-01	--	--	2.2E-04	2.2E-04	--	--	3.8E-02	3.8E-02	--	--	3.8E-02	3.8E-02
DDT ^c	0	1.1E+00	1.0E-03	2.2E-03	2.2E-03	4.1E+00	6.4E-02	3.8E-01	3.8E-01	2.8E-01	2.5E-04	2.2E-04	2.2E-04	1.4E+01	1.6E-02	3.8E-02	3.8E-02	4.1E+00	1.6E-02	3.8E-02	3.8E-02
Demeton	0	--	1.0E-01	--	--	--	6.4E+00	--	--	--	2.5E-02	--	--	--	1.6E+00	--	--	--	1.6E+00	--	--
Diazinon	0	1.7E-01	1.7E-01	--	--	6.3E-01	1.1E+01	--	--	4.3E-02	4.3E-02	--	--	2.2E+00	2.7E+00	--	--	6.3E-01	2.7E+00	--	--
Dibenz(a,h)anthracene ^c	0	--	--	3.8E-02	1.8E-01	--	--	6.5E+00	3.1E+01	--	--	3.8E-03	1.8E-02	--	--	6.5E-01	3.1E+00	--	--	6.5E-01	3.1E+00
1,2-Dichlorobenzene	0	--	--	4.2E+02	1.3E+03	--	--	3.5E+04	1.1E+05	--	--	4.2E+01	1.3E+02	--	--	3.5E+03	1.1E+04	--	--	3.5E+03	1.1E+04
1,3-Dichlorobenzene	0	--	--	3.2E+02	9.6E+02	--	--	2.7E+04	8.0E+04	--	--	3.2E+01	9.6E+01	--	--	2.7E+03	8.0E+03	--	--	2.7E+03	8.0E+03
1,4-Dichlorobenzene	0	--	--	6.3E+01	1.9E+02	--	--	5.2E+03	1.6E+04	--	--	6.3E+00	1.9E+01	--	--	5.2E+02	1.6E+03	--	--	5.2E+02	1.6E+03
3,3-Dichlorobenzidine ^c	0	--	--	2.1E-01	2.8E-01	--	--	3.6E+01	4.8E+01	--	--	2.1E-02	2.8E-02	--	--	3.6E+00	4.8E+00	--	--	3.6E+00	4.8E+00
Dichlorobromomethane ^c	0	--	--	5.5E+00	1.7E+02	--	--	9.4E+02	2.9E+04	--	--	5.5E-01	1.7E+01	--	--	9.4E+01	2.9E+03	--	--	9.4E+01	2.9E+03
1,2-Dichloroethane ^c	0	--	--	3.8E+00	3.7E+02	--	--	6.5E+02	6.3E+04	--	--	3.8E-01	3.7E+01	--	--	6.5E+01	6.3E+03	--	--	6.5E+01	6.3E+03
1,1-Dichloroethylene	0	--	--	3.3E+02	7.1E+03	--	--	2.7E+04	5.9E+05	--	--	3.3E+01	7.1E+02	--	--	2.7E+03	5.9E+04	--	--	2.7E+03	5.9E+04
1,2-trans-dichloroethylene	0	--	--	1.4E+02	1.0E+04	--	--	1.2E+04	8.3E+05	--	--	1.4E+01	1.0E+03	--	--	1.2E+03	8.3E+04	--	--	1.2E+03	8.3E+04
2,4-Dichlorophenol	0	--	--	7.7E+01	2.9E+02	--	--	6.4E+03	2.4E+04	--	--	7.7E+00	2.9E+01	--	--	6.4E+02	2.4E+03	--	--	6.4E+02	2.4E+03
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	1.0E+02	--	--	--	8.3E+03	--	--	--	1.0E+01	--	--	--	8.3E+02	--	--	--	8.3E+02	--
1,2-Dichloropropane ^c	0	--	--	5.0E+00	1.5E+02	--	--	8.6E+02	2.6E+04	--	--	5.0E-01	1.5E+01	--	--	8.6E+01	2.6E+03	--	--	8.6E+01	2.6E+03
1,3-Dichloropropene ^c	0	--	--	3.4E+00	2.1E+02	--	--	5.8E+02	3.6E+04	--	--	3.4E-01	2.1E+01	--	--	5.8E+01	3.6E+03	--	--	5.8E+01	3.6E+03
Dieldrin ^c	0	2.4E-01	5.6E-02	5.2E-04	5.4E-04	8.9E-01	3.6E+00	8.9E-02	9.3E-02	6.0E-02	1.4E-02	5.2E-05	5.4E-05	3.1E+00	8.9E-01	8.9E-03	9.3E-03	8.9E-01	8.9E-01	8.9E-03	9.3E-03
Diethyl Phthalate	0	--	--	1.7E+04	4.4E+04	--	--	1.4E+06	3.6E+06	--	--	1.7E+03	4.4E+03	--	--	1.4E+05	3.6E+05	--	--	1.4E+05	3.6E+05
2,4-Dimethylphenol	0	--	--	3.8E+02	8.5E+02	--	--	3.1E+04	7.0E+04	--	--	3.8E+01	8.5E+01	--	--	3.1E+03	7.0E+03	--	--	3.1E+03	7.0E+03
Dimethyl Phthalate	0	--	--	2.7E+05	1.1E+06	--	--	2.2E+07	9.1E+07	--	--	2.7E+04	1.1E+05	--	--	2.2E+06	9.1E+06	--	--	2.2E+06	9.1E+06
Di-n-Butyl Phthalate	0	--	--	2.0E+03	4.5E+03	--	--	1.7E+05	3.7E+05	--	--	2.0E+02	4.5E+02	--	--	1.7E+04	3.7E+04	--	--	1.7E+04	3.7E+04
2,4-Dinitrophenol	0	--	--	6.9E+01	5.3E+03	--	--	5.7E+03	4.4E+05	--	--	6.9E+00	5.3E+02	--	--	5.7E+02	4.4E+04	--	--	5.7E+02	4.4E+04
2-Methyl-4,6-Dinitrophenol	0	--	--	1.3E+01	2.8E+02	--	--	1.1E+03	2.3E+04	--	--	1.3E+00	2.8E+01	--	--	1.1E+02	2.3E+03	--	--	1.1E+02	2.3E+03
2,4-Dinitrotoluene ^c	0	--	--	1.1E+00	3.4E+01	--	--	1.9E+02	5.8E+03	--	--	1.1E-01	3.4E+00	--	--	1.9E+01	5.8E+02	--	--	1.9E+01	5.8E+02
Dioxin 2,3,7,8- tetrachlorodibenzo-p-dioxin	0	--	--	5.0E-08	5.1E-08	--	--	4.1E-06	4.2E-08	--	--	5.0E-09	5.1E-09	--	--	4.1E-07	4.2E-07	--	--	4.1E-07	4.2E-07
1,2-Diphenylhydrazine ^c	0	--	--	3.6E-01	2.0E+00	--	--	6.2E+01	3.4E+02	--	--	3.6E-02	2.0E-01	--	--	6.2E+00	3.4E+01	--	--	6.2E+00	3.4E+01
Alpha-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	8.2E-01	3.6E+00	5.1E+03	7.4E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.8E+00	8.9E-01	5.1E+02	7.4E+02	8.2E-01	8.9E-01	5.1E+02	7.4E+02
Beta-Endosulfan	0	2.2E-01	5.6E-02	6.2E+01	8.9E+01	8.2E-01	3.6E+00	5.1E+03	7.4E+03	5.5E-02	1.4E-02	6.2E+00	8.9E+00	2.8E+00	8.9E-01	5.1E+02	7.4E+02	8.2E-01	8.9E-01	5.1E+02	7.4E+02
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	8.2E-01	3.6E+00	--	--	5.5E-02	1.4E-02	--	--	2.8E+00	8.9E-01	--	--	8.2E-01	8.9E-01	--	--
Endosulfan Sulfate	0	--	--	6.2E+01	8.9E+01	--	--	5.1E+03	7.4E+03	--	--	6.2E+00	8.9E+00	--	--	5.1E+02	7.4E+02	--	--	5.1E+02	7.4E+02
Endrin	0	8.6E-02	3.6E-02	5.9E-02	6.0E-02	3.2E-01	2.3E+00	4.9E+00	5.0E+00	2.2E-02	9.0E-03	5.9E-03	6.0E-03	1.1E+00	5.7E-01	4.9E-01	5.0E-01	3.2E-01	5.7E-01	4.9E-01	5.0E-01
Endrin Aldehyde	0	--	--	2.9E-01	3.0E-01	--	--	2.4E+01	2.5E+01	--	--	2.9E-02	3.0E-02	--	--	2.4E+00	2.5E+00	--	--	2.4E+00	2.5E+00

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Waste Load Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	5.3E+02	2.1E+03	--	--	4.4E+04	1.7E+05	--	--	5.3E+01	2.1E+02	--	--	4.4E+03	1.7E+04	--	--	4.4E+03	1.7E+04
Fluoranthene	0	--	--	1.3E+02	1.4E+02	--	--	1.1E+04	1.2E+04	--	--	1.3E+01	1.4E+01	--	--	1.1E+03	1.2E+03	--	--	1.1E+03	1.2E+03
Fluorene	0	--	--	1.1E+03	5.3E+03	--	--	9.1E+04	4.4E+05	--	--	1.1E+02	5.3E+02	--	--	9.1E+03	4.4E+04	--	--	9.1E+03	4.4E+04
Foaming Agents	0	--	--	5.0E+02	--	--	--	4.1E+04	--	--	--	5.0E+01	--	--	--	4.1E+03	--	--	--	4.1E+03	--
Guthion	0	--	1.0E-02	--	--	--	6.4E-01	--	--	--	2.5E-03	--	--	--	1.6E-01	--	--	--	1.6E-01	--	--
Heptachlor ^c	0	5.2E-01	3.8E-03	7.9E-04	7.9E-04	1.9E+00	2.4E-01	1.4E-01	1.4E-01	1.3E-01	9.5E-04	7.9E-05	7.9E-05	6.6E+00	6.0E-02	1.4E-02	1.4E-02	1.9E+00	6.0E-02	1.4E-02	1.4E-02
Heptachlor Epoxide ^c	0	5.2E-01	3.8E-03	3.9E-04	3.9E-04	1.9E+00	2.4E-01	6.7E-02	6.7E-02	1.3E-01	9.5E-04	3.9E-05	3.9E-05	6.6E+00	6.0E-02	6.7E-03	6.7E-03	1.9E+00	6.0E-02	6.7E-03	6.7E-03
Hexachlorobenzene ^c	0	--	--	2.8E-03	2.9E-03	--	--	4.8E-01	5.0E-01	--	--	2.8E-04	2.9E-04	--	--	4.8E-02	5.0E-02	--	--	4.8E-02	5.0E-02
Hexachlorobutadiene ^c	0	--	--	4.4E+00	1.8E+02	--	--	7.5E+02	3.1E+04	--	--	4.4E-01	1.8E+01	--	--	7.5E+01	3.1E+03	--	--	7.5E+01	3.1E+03
Hexachlorocyclohexane Alpha-BHC ^c	0	--	--	2.6E-02	4.9E-02	--	--	4.5E+00	8.4E+00	--	--	2.6E-03	4.9E-03	--	--	4.5E-01	8.4E-01	--	--	4.5E-01	8.4E-01
Hexachlorocyclohexane Beta-BHC ^c	0	--	--	9.1E-02	1.7E-01	--	--	1.6E+01	2.9E+01	--	--	9.1E-03	1.7E-02	--	--	1.6E+00	2.9E+00	--	--	1.6E+00	2.9E+00
Hexachlorocyclohexane Gamma-BHC ^c (Lindane)	0	9.5E-01	--	9.8E-01	1.8E+00	3.5E+00	--	1.7E+02	3.1E+02	2.4E-01	--	9.8E-02	1.8E-01	1.2E+01	--	1.7E+01	3.1E+01	3.6E+00	--	1.7E+01	3.1E+01
Hexachlorocyclopentadiene	0	--	--	4.0E+01	1.1E+03	--	--	3.3E+03	9.1E+04	--	--	4.0E+00	1.1E+02	--	--	3.3E+02	9.1E+03	--	--	3.3E+02	9.1E+03
Hexachloroethane ^c	0	--	--	1.4E+01	3.3E+01	--	--	2.4E+03	5.7E+03	--	--	1.4E+00	3.3E+00	--	--	2.4E+02	5.7E+02	--	--	2.4E+02	5.7E+02
Hydrogen Sulfide	0	--	2.0E+00	--	--	--	1.3E+02	--	--	--	5.0E-01	--	--	--	3.2E+01	--	--	--	3.2E+01	--	--
Indeno (1,2,3-cd) pyrene ^c	0	--	--	3.8E-02	1.8E-01	--	--	6.5E+00	3.1E+01	--	--	3.8E-03	1.8E-02	--	--	6.5E-01	3.1E+00	--	--	6.5E-01	3.1E+00
Iron	0	--	--	3.0E+02	--	--	--	2.5E+04	--	--	--	3.0E+01	--	--	--	2.5E+03	--	--	--	2.5E+03	--
Isophorone ^c	0	--	--	3.5E+02	9.6E+03	--	--	6.0E+04	1.6E+06	--	--	3.5E+01	9.6E+02	--	--	6.0E+03	1.6E+05	--	--	6.0E+03	1.6E+05
Kepone	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Lead	0	1.1E+02	9.5E+00	1.5E+01	--	3.9E+02	6.0E+02	1.2E+03	--	2.1E+01	2.4E+00	1.5E+00	--	1.1E+03	1.5E+02	1.2E+02	--	3.9E+02	1.6E+02	1.2E+02	--
Malathion	0	--	1.0E-01	--	--	--	6.4E+00	--	--	--	2.5E-02	--	--	--	1.6E+00	--	--	--	1.6E+00	--	--
Manganese	0	--	--	5.0E+01	--	--	--	4.1E+03	--	--	--	5.0E+00	--	--	--	4.1E+02	--	--	--	4.1E+02	--
Mercury	0	1.4E+00	7.7E-01	--	--	5.2E+00	4.9E+01	--	--	3.5E-01	1.9E-01	--	--	1.8E+01	1.2E+01	--	--	6.2E+00	1.2E+01	--	--
Methyl Bromide	0	--	--	4.7E+01	1.5E+03	--	--	3.9E+03	1.2E+05	--	--	4.7E+00	1.5E+02	--	--	3.9E+02	1.2E+04	--	--	3.9E+02	1.2E+04
Methylene Chloride ^c	0	--	--	4.6E+01	5.9E+03	--	--	7.9E+03	1.0E+06	--	--	4.6E+00	5.9E+02	--	--	7.9E+02	1.0E+05	--	--	7.9E+02	1.0E+05
Methoxychlor	0	--	3.0E-02	1.0E+02	--	--	1.9E+00	6.3E+03	--	--	7.5E-03	1.0E+01	--	--	4.8E-01	8.3E+02	--	--	4.8E-01	8.3E+02	--
Mirex	0	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--	--	0.0E+00	--	--
Nickel	0	1.7E+02	1.6E+01	6.1E+02	4.6E+03	6.3E+02	1.0E+03	5.1E+04	3.8E+05	3.6E+01	4.0E+00	6.1E+01	4.6E+02	1.8E+03	2.5E+02	5.1E+03	3.8E+04	6.3E+02	2.5E+02	5.1E+03	3.8E+04
Nitrate (as N)	0.865	--	--	1.0E+04	--	--	--	8.3E+05	--	--	--	1.0E+03	--	--	--	8.3E+04	--	--	--	8.3E+04	--
Nitrobenzene	0	--	--	1.7E+01	6.9E+02	--	--	1.4E+03	5.7E+04	--	--	1.7E+00	6.9E+01	--	--	1.4E+02	5.7E+03	--	--	1.4E+02	5.7E+03
N-Nitrosodimethylamine ^c	0	--	--	6.9E-03	3.0E+01	--	--	1.2E+03	5.1E+03	--	--	6.9E-04	3.0E+00	--	--	1.2E-01	5.1E+02	--	--	1.2E-01	5.1E+02
N-Nitrosodiphenylamine ^c	0	--	--	3.3E+01	6.0E+01	--	--	5.7E+03	1.0E+04	--	--	3.3E+00	6.0E+00	--	--	5.7E+02	1.0E+03	--	--	5.7E+02	1.0E+03
N-Nitrosodi-n-propylamine ^c	0	--	--	5.0E-02	5.1E+00	--	--	8.6E+00	8.7E+02	--	--	5.0E-03	5.1E-01	--	--	8.6E-01	8.7E+01	--	--	8.6E-01	8.7E+01
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.0E+02	4.2E+02	--	--	7.0E+00	1.7E+00	--	--	3.6E+02	1.0E+02	--	--	1.0E+02	1.0E+02	--	--
Parathion	0	6.5E-02	1.3E-02	--	--	2.4E-01	8.3E-01	--	--	1.6E-02	3.3E-03	--	--	8.3E-01	2.1E-01	--	--	2.4E-01	2.1E-01	--	--
PCB Total ^c	0	--	1.4E-02	6.4E-04	6.4E-04	--	8.9E-01	1.1E-01	1.1E-01	--	3.5E-03	6.4E-05	6.4E-05	--	2.2E-01	1.1E-02	1.1E-02	--	2.2E-01	1.1E-02	1.1E-02
Pentachlorophenol ^c	0	1.1E+01	1.1E+01	2.7E+00	3.0E+01	4.1E+01	6.9E+02	4.6E+02	5.1E+03	3.5E+00	2.7E+00	2.7E-01	3.0E+00	1.8E+02	1.7E+02	4.6E+01	5.1E+02	4.1E+01	1.7E+02	4.6E+01	5.1E+02
Phenol	0	--	--	1.0E+04	8.6E+05	--	--	8.3E+05	7.1E+07	--	--	1.0E+03	8.6E+04	--	--	8.3E+04	7.1E+06	--	--	8.3E+04	7.1E+06
Pyrene	0	--	--	8.3E+02	4.0E+03	--	--	6.9E+04	3.3E+05	--	--	8.3E+01	4.0E+02	--	--	6.9E+03	3.3E+04	--	--	6.9E+03	3.3E+04
Radionuclides	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Gross Alpha Activity (pCi/L)	0	--	--	1.5E+01	--	--	--	1.2E+03	--	--	--	1.5E+00	--	--	--	1.2E+02	--	--	--	1.2E+02	--
Beta and Photon Activity (mrem/yr)	0	--	--	4.0E+00	--	--	--	3.3E+02	--	--	--	4.0E-01	--	--	--	3.3E+01	--	--	--	3.3E+01	--
Radium 226 + 228 (pCi/L)	0	--	--	5.0E+00	--	--	--	4.1E+02	--	--	--	5.0E-01	--	--	--	4.1E+01	--	--	--	4.1E+01	--
Uranium (ug/l)	0	--	--	3.0E+01	--	--	--	2.5E+03	--	--	--	3.0E+00	--	--	--	2.5E+02	--	--	--	2.5E+02	--

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	1.7E+02	4.2E+03	7.4E+01	3.2E+02	1.4E+04	3.5E+05	5.0E+00	1.3E+00	1.7E+01	4.2E+02	2.6E+02	7.9E+01	1.4E+03	3.5E+04	7.4E+01	7.9E+01	1.4E+03	3.5E+04
Silver	0	2.9E+00	-	-	-	1.1E+01	-	-	-	5.4E-01	-	-	-	2.7E+01	-	-	-	1.1E+01	-	-	-
Sulfate	0	-	-	2.5E+05	-	-	-	2.1E+07	-	-	-	2.5E+04	-	-	-	2.1E+06	-	-	-	2.1E+06	-
1,1,2,2-Tetrachloroethane ^c	0	-	-	1.7E+00	4.0E+01	-	-	2.9E+02	6.9E+03	-	-	1.7E-01	4.0E+00	-	-	2.9E+01	6.9E+02	-	-	2.9E+01	6.9E+02
Tetrachloroethylene ^c	0	-	-	6.9E+00	3.3E+01	-	-	1.2E+03	5.7E+03	-	-	6.9E-01	3.3E+00	-	-	1.2E+02	5.7E+02	-	-	1.2E+02	5.7E+02
Thallium	0	-	-	2.4E-01	4.7E-01	-	-	2.0E+01	3.9E+01	-	-	2.4E-02	4.7E-02	-	-	2.0E+00	3.9E+00	-	-	2.0E+00	3.9E+00
Toluene	0	-	-	5.1E+02	6.0E+03	-	-	4.2E+04	5.0E+05	-	-	5.1E+01	6.0E+02	-	-	4.2E+03	5.0E+04	-	-	4.2E+03	5.0E+04
Total dissolved solids	0	-	-	5.0E+05	-	-	-	4.1E+07	-	-	-	5.0E+04	-	-	-	4.1E+06	-	-	-	4.1E+06	-
Toxaphene ^c	0	7.3E-01	2.0E-04	2.8E-03	2.8E-03	2.7E+00	1.3E-02	4.8E-01	4.8E-01	1.8E-01	5.0E-05	2.8E-04	2.8E-04	9.3E+00	3.2E-03	4.8E-02	4.8E-02	2.7E+00	3.2E-03	4.8E-02	4.8E-02
Tributyltin	0	4.6E-01	7.2E-02	-	-	1.7E+00	4.6E+00	-	-	1.2E-01	1.8E-02	-	-	5.9E+00	1.1E+00	-	-	1.7E+00	1.1E+00	-	-
1,2,4-Trichlorobenzene	0	-	-	3.5E+01	7.0E+01	-	-	2.9E+03	5.8E+03	-	-	3.5E+00	7.0E+00	-	-	2.9E+02	5.8E+02	-	-	2.9E+02	5.8E+02
1,1,2-Trichloroethane ^c	0	-	-	5.9E+00	1.6E+02	-	-	1.0E+03	2.7E+04	-	-	5.9E-01	1.6E+01	-	-	1.0E+02	2.7E+03	-	-	1.0E+02	2.7E+03
Trichloroethylene ^c	0	-	-	2.5E+01	3.0E+02	-	-	4.3E+03	5.1E+04	-	-	2.5E+00	3.0E+01	-	-	4.3E+02	5.1E+03	-	-	4.3E+02	5.1E+03
2,4,6-Trichlorophenol ^c	0	-	-	1.4E+01	2.4E+01	-	-	2.4E+03	4.1E+03	-	-	1.4E+00	2.4E+00	-	-	2.4E+02	4.1E+02	-	-	2.4E+02	4.1E+02
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	-	-	5.0E+01	-	-	-	4.1E+03	-	-	-	5.0E+00	-	-	-	4.1E+02	-	-	-	4.1E+02	-
Vinyl Chloride ^c	0	-	-	2.5E-01	2.4E+01	-	-	4.3E+01	4.1E+03	-	-	2.5E-02	2.4E+00	-	-	4.3E+00	4.1E+02	-	-	4.3E+00	4.1E+02
Zinc	0	1.1E+02	9.3E+01	7.4E+03	2.6E+04	4.0E+02	5.9E+03	6.1E+05	2.2E+06	2.3E+01	2.3E+01	7.4E+02	2.6E+03	1.2E+03	1.5E+03	6.1E+04	2.2E+05	4.0E+02	1.5E+03	6.1E+04	2.2E+05

Notes:

- All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
- Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
- Metals measured as Dissolved, unless specified otherwise
- "C" indicates a carcinogenic parameter
- Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information. Antidegradation WLAs are based upon a complete mix.
- Antideg. Baseline = $(0.25(WQC - \text{background conc.}) + \text{background conc.})$ for acute and chronic
 $= (0.1(WQC - \text{background conc.}) + \text{background conc.})$ for human health
- WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	4.6E+01
Arsenic	8.3E+01
Barium	1.7E+04
Cadmium	5.3E+00
Chromium III	5.6E+02
Chromium VI	2.4E+01
Copper	1.8E+01
Iron	2.5E+03
Lead	9.0E+01
Manganese	4.1E+02
Mercury	2.1E+00
Nickel	1.5E+02
Selenium	3.0E+01
Silver	4.4E+00
Zinc	1.6E+02

Note: do not use QL's lower than the minimum QL's provided in agency guidance

4/23/2014 9:32:13 AM

Facility = Lower Stroubles Creek WWTP
Chemical = Chronic Toxicity - P. promelas
Chronic averaging period = 4
WLAa =
WLAc = 11.11
Q.L. = 1
samples/mo. = 1
samples/wk. = 1

Summary of Statistics:

observations = 5
Expected Value = 1.432
Variance = .738224
C.V. = 0.6
97th percentile daily values = 3.48465
97th percentile 4 day average = 2.38254
97th percentile 30 day average = 1.72706
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1
1
1
1
3.16

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Spreadsheet for determination of WET test endpoints or WET limits														
2															
3	Excel 97		Acute Endpoint/Permit Limit			Use as LC ₅₀ in Special Condition, as TU _a on DMR									
4	Revision Date: 01/10/05														
5	File: WETLIM10.xls		ACUTE 1.11330336 TU _a			LC ₅₀ =		90 % Use as		1.11		TU _a			
6	(MIX.EXE required also)		ACUTE WLA _a			1.11330333		Note: Inform the permittee that if the mean of the data exceeds this TU _a : 1.0 a limit may result using WLA EXE							
7															
8															
9															
10															
11															
12				Chronic Endpoint/Permit Limit			Use as NOEC in Special Condition, as TU _c on DMR								
13				CHRONIC 11.1330336 TU _c			NOEC =		9 % Use as		11.11		TU _c		
14				BOTH* 11.1330336 TU _c			NOEC =		9 % Use as		11.11		TU _c		
15				AML 11.1330336 TU _c			NOEC =		9 % Use as		11.11		TU _c		
16	Enter data in the cells with blue type:														
17	Entry Date:		04/23/14		ACUTE WLA _{a,c}		11.1330333		Note: Inform the permittee that if the mean of the data exceeds this TU _c : 4.57506083						
18	Facility Name:				CHRONIC WLA _c		63.5555556								
19	VPDES Number:		VA0060844		* Both means acute expressed as chronic: a limit may result using WLA EXE										
20	Outfall Number:		1												
21															
22															
23	Plant Flow:		9 MGD		% Flow to be used from MIX.EXE					Diffuser /modeling study?					
24	Acute 1Q10:		451 MGD		6.41 %					Enter Y/N N					
25	Chronic 7Q10:		553 MGD		100 %					Acute 1:1					
26															
27															
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A	B	C	D	E	F	G	H	I	J	K	L	M	N	O				
50	Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)																	
51	IF YOU HAVE AT LEAST 10 DATA POINTS THAT				Vertebrate				Invertebrate									
52	ARE QUANTIFIABLE (NOT "<" OR ">")				IC ₂₅ Data				IC ₂₅ Data									
53	FOR A SPECIES, ENTER THE DATA IN EITHER				or				or									
54	COLUMN "G" (VERTEBRATE) OR COLUMN				LC ₅₀ Data				LN of data				LC ₅₀ Data		LN of data			
55	"J" (INVERTEBRATE). THE "CV WILL BE				*****				*****									
56	PICKED UP FOR THE CALCULATIONS				1				0				1		0			
57	BELOW. THE DEFAULT VALUES FOR eA,				2								2					
58	eB, AND eC WILL CHANGE IF THE "CV IS				3								3					
59	ANYTHING OTHER THAN 0.6				4								4					
60					5								5					
61					6								6					
62					7								7					
63	Coefficient of Variation for effluent tests				8								8					
64					9								9					
65	CV = 0.6 (Default 0.6)				10								10					
66					11								11					
67	σ ² = 0.3074847				12								12					
68	σ = 0.554513029				13								13					
69					14								14					
70	Using the log variance to develop eA				15								15					
71	(P. 100, step 2a of TSD)				16								16					
72	Z = 1.881 (97% probability stat from table				17								17					
73	A = -0.88929658				18								18					
74	eA = 0.410644686				19								19					
75					20								20					
76	Using the log variance to develop eB																	
77	(P. 100, step 2b of TSD)				St Dev				NEED DATA				St Dev				NEED DATA	
78	σ _B ² = 0.086177696				Mean				0				Mean				0	
79	σ _B = 0.293560379				Variance				0				Variance				0	
80	B = -0.50909823				CV				0				CV				0	
81	eB = 0.601037335																	
82																		
83	Using the log variance to develop eC																	
84	(P. 100, step 4a of TSD)																	
85																		
86	σ ² = 0.3074847																	
87	σ = 0.554513029																	
88	C = 0.889296658																	
89	eC = 2.433417525																	
90																		
91	Using the log variance to develop eD																	
92	(P. 100, step 4b of TSD)																	
93	n = 1				This number will most likely stay as "1", for 1 sample/month.													
94	σ _n ² = 0.3074847																	
95	σ _n = 0.554513029																	
96	D = 0.889296658																	
97	eD = 2.433417525																	
98																		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
110	Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)														
111	To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC ₅₀ , since the ACR divides the LC ₅₀ by the NOEC. LC ₅₀ 's > 100% should not be used.														
112	Table 1. ACR using Vertebrate data								Convert LC₅₀'s and NOEC's to Chronic TU's						
113									for use in WLA.EXE						
114									ACR used: 10						
115	Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use							
116	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
117	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
118	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
119	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
120	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
121	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
122	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
123	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
124	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
125	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
126	ACR for vertebrate data:								0						
127	Table 1. Result								Vertebrate ACR						
128	Table 2. Result								Invertebrate ACR						
129									Lowest ACR						
130									Default to 10						
131	Table 2. ACR using Invertebrate data														
132	Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog	ACR to Use							
133	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
134	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
135	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
136	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
137	5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
138	6	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
139	7	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
140	8	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
141	9	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
142	10	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	NO DATA							
143	ACR for vertebrate data:								0						
144															
145	DILUTION SERIES TO RECOMMEND														
146	Table 4.														
147					Monitoring		Limit								
148					% Effluent		TUc		% Effluent		TUc				
149	Dilution series based on data mean				21.9		4.575061		9		11.111111				
150	Dilution series to use for limit														
151	Dilution factor to recommend:				0.4675215				0.3						
152	Dilution series to recommend:				100.0		1.00		100.0		1.00				
153					45.6		2.14		30.0		3.33				
154					21.9		4.56		9.0		11.11				
155					10.2		9.79		2.7		37.04				
156					4.78		20.93		0.8		123.46				
157	Extra dilutions if needed				2.23		44.77		0.2		411.52				
158					1.04		95.76		0.1		1371.74				
159															
160															

Cell: I9

Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18

Comment: This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22

Comment: Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40

Comment: If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41

Comment: If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.5", make sure you have selected "Y" in cell E20

Cell: L48

Comment: See Row 151 for the appropriate duration series to use for these NOEC's

Cell: G62

Comment: Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J62

Comment: Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117

Comment: Vertebrates are:
Pimephales promelas
Cyprinodon variegatus

Cell: M119

Comment: The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121

Comment: If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TU's. The calculation is the same: $100/\text{NOEC} = \text{TUc}$ or $100/\text{LC50} = \text{TUa}$.

Cell: C138

Comment: Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Model Results
Previous 3/2/95 Mod.
Lower Stroubles Creek STP

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF ENVIRONMENTAL QUALITY

ROANOKE WATER REGIONAL OFFICE

P. O. Box 7017
Roanoke, VA 24019

703/562-3666

MEMORANDUM

Subject: Pepper's Ferry STP & Blacksburg → Lower Stroubles ^{Creek} STP)
Regional Model Version 3.2 Results

To: File

From: James D. Scott, ^{MD} Environmental Engineer

Date: May 10, 1994

Copies:

Several model (Version 3.2) runs were initiated due to concerns over the Blacksburg-VPI and Pepper's Ferry STP's antidegradation issues concerning DO in the New River.

These model runs did not account for the RAAP facility discharges. Since the RAAP facilities were discharging to the New River in this stretch prior to 1972, the impacts associated with the RAAP discharges were not considered in this analysis of the impacts of the Pepper's Ferry and Blacksburg discharges. Also, please note that the complexities associated with modeling this section of the New River are probably beyond the capabilities of the regional modeling system version 3.2. Nonetheless, I feel that the results are somewhat indicative of the situation we are currently reviewing.

Many runs were made using the "traditional" approach to inputs to the model. Specifically, the entire 7Q10 and the maximum weekly loads were input, and the results showed no DO depletion (i.e. antidegradation is complied with). Several additional runs were made with various fluctuations in loadings. One run used the BOD of 90 mg/l for Pepper's Ferry (9 MD), and 36 mg/l (9 MGD) for Blacksburg, and showed no significant impact to instream DO's.

In light of the fact that the previous model for Blacksburg was run at 1/2 7Q10 due to mixing issues, an additional model was run at a 7Q10 of 307 MGD (7Q10 = 614 MGD). This run was made at a BOD of 45 mg/l (9MGD) for Pepper's Ferry, and 36 mg/l BOD (9MGD) for Blacksburg. Again the model predicted no significant in stream DO depletion, and indicates that antidegradation, as defined in the Guidance Memo 93-015, and in terms of BOD, is complied with by allowing Blacksburg to remain at 24 mg/l BOD (9MGD) and allowing Pepper's Ferry to remain at 30 mg/l BOD, monthly average.

REGIONAL MODELING SYSTEM

VERSION 3.2

DATA FILE SUMMARY

THE NAME OF THE DATA FILE IS: PEPXXX.MOD

THE STREAM NAME IS: NEW RIVER
THE RIVER BASIN IS: NEW RIVER
THE SECTION NUMBER IS: 2a
THE CLASSIFICATION IS: IV

STANDARDS VIOLATED (Y/N) = N
STANDARDS APPROPRIATE (Y/N) = Y

DISCHARGE WITHIN 3 MILES (Y/N) = N

THE DISCHARGE BEING MODELED IS: PEPPER'S FERRY STP

PROPOSED LIMITS ARE:

FLOW = 9 MGD
BOD5 = 45 MG/L
TKN = 10 MG/L
D.O. = 6 MG/L

THE NUMBER OF SEGMENTS TO BE MODELED = 2

7Q10 WILL BE CALCULATED BY: FLOW COMPARISON

THE GAUGE NAME IS: 1/2 WQAP FLOW TABLE
GAUGE DRAINAGE AREA = 2790 SQ.MI.
OBSERVED FLOW AT GAUGE = 307 MGD
GAUGE 7Q10 = 307 MGD
OBSERVED FLOW AT DISCHARGE = 307 MGD

STREAM A DRY DITCH AT DISCHARGE (Y/N) = N
ANTIDEGRADATION APPLIES (Y/N) = Y

ALLOCATION DESIGN TEMPERATURE = 24 $\frac{1}{2}$ C

MAX LOADS

1/2 7Q10

SEGMENT INFORMATION

SEGMENT # 1

SEGMENT ENDS BECAUSE: A DISCHARGE ENTERS AT END

SEGMENT LENGTH = 2.175 MI

SEGMENT WIDTH = 150 FT

SEGMENT DEPTH = 5 FT

SEGMENT VELOCITY = 1 FT/SEC

DRAINAGE AREA AT SEGMENT START = 2790 SQ.MI.

DRAINAGE AREA AT SEGMENT END = 2817 SQ.MI.

ELEVATION AT UPSTREAM END = 1725 FT

ELEVATION AT DOWNSTREAM END = 1675 FT

THE CROSS SECTION IS: IRREGULAR

THE CHANNEL IS: MODERATELY MEANDERING

POOLS AND RIFFLES (Y/N) = Y

THE SEGMENT LENGTH IS 75 % POOLS

POOL DEPTH = 6 FT

THE SEGMENT LENGTH IS 25 % RIFFLES

RIFFLE DEPTH = 2 FT

THE BOTTOM TYPE = BOULDERS

SLUDGE DEPOSITS = NONE

AQUATIC PLANTS = FEW

ALGAE OBSERVED = NONE

WATER COLORED GREEN (Y/N) = N

THE DISCHARGE AT THE SEGMENT END IS: BLACKSBURG STP

ITS CONCENTRATIONS ARE:

FLOW = 9 MGD

BOD5 = 36 MG/L

TKN = 15 MG/L

D.O. = 6.6 MG/L

1 1720

2 1718

SEGMENT INFORMATION

SEGMENT # 2

SEGMENT ENDS BECAUSE: THE MODEL ENDS

SEGMENT LENGTH = 3 MI

SEGMENT WIDTH = 200 FT

SEGMENT DEPTH = 3 FT

SEGMENT VELOCITY = 1 FT/SEC

DRAINAGE AREA AT SEGMENT START = 2817 SQ.MI.

DRAINAGE AREA AT SEGMENT END = 2862 SQ.MI.

ELEVATION AT UPSTREAM END = 1675 FT

ELEVATION AT DOWNSTREAM END = 1625 FT

THE CROSS SECTION IS: IRREGULAR

THE CHANNEL IS: MODERATELY MEANDERING

POOLS AND RIFFLES (Y/N) = Y

THE SEGMENT LENGTH IS 25 % POOLS

POOL DEPTH = 6 FT

THE SEGMENT LENGTH IS 75 % RIFFLES

RIFFLE DEPTH = 2 FT

THE BOTTOM TYPE = BOULDERS

SLUDGE DEPOSITS = NONE

AQUATIC PLANTS = HEAVY

ALGAE OBSERVED = COVERS ENTIRE BOTTOM

WATER COLORED GREEN (Y/N) = N

REGIONAL MODELING SYSTEM Ver 3.2 (OWRM - 9/90)
08-26-1994 15:11:42

REGIONAL MODELING SYSTEM VERSION 3.2

MODEL SIMULATION FOR THE PEPPER'S FERRY STP DISCHARGE

TO NEW RIVER

COMMENT: MODEL RUN WITHOUT RAAP DISCHARGES

THE SIMULATION STARTS AT THE PEPPER'S FERRY STP DISCHARGE

***** PROPOSED PERMIT LIMITS *****

FLOW = 9 MGD CBOD5 = 45 Mg/L TKN = 10 Mg/L D.O. = 6 Mg/L

**** THE MAXIMUM CHLORINE ALLOWABLE IN THE DISCHARGE IS 0.386 Mg/L ****

THE SECTION BEING MODELED IS BROKEN INTO 2 SEGMENTS
RESULTS WILL BE GIVEN AT 0.1 MILE INTERVALS

***** BACKGROUND CONDITIONS *****

THE 7Q10 STREAM FLOW AT THE DISCHARGE IS 307.00000 MGD
THE DISSOLVED OXYGEN OF THE STREAM IS 7.173 Mg/L
THE BACKGROUND CBODu OF THE STREAM IS 5 Mg/L
THE BACKGROUND NBOD OF THE STREAM IS 0 Mg/L

***** MODEL PARAMETERS *****

SEG.	LEN. Mi	VEL. F/S	K2 1/D	K1 1/D	KN 1/D	BENTHIC Mg/L	ELEV. Ft	TEMP. °C	DO-SAT Mg/L
1	2.17	1.217	13.793	0.800	0.350	0.000	1700.00	24.00	7.970
2	3.00	0.834	10.000	0.800	0.350	0.000	1650.00	24.00	7.984

(The K Rates shown are at 20½C ... the model corrects them for temperature.)

RESPONSE FOR SEGMENT 1

TOTAL STREAMFLOW = 316.0000 MGD
(Including Discharge)

DISTANCE FROM HEAD OF SEGMENT (MI.)	TOTAL DISTANCE FROM MODEL BEGINNING (MI.)	DISSOLVED OXYGEN (Mg/L)	CBODu (Mg/L)	nBODu (Mg/L)
0.000	0.000	7.139	8.062	0.863
0.100	0.100	7.161	8.023	0.861
0.200	0.200	7.173	7.984	0.859
0.300	0.300	7.173	7.946	0.857
0.400	0.400	7.173	7.907	0.855
0.500	0.500	7.173	7.869	0.853
0.600	0.600	7.173	7.832	0.851
0.700	0.700	7.173	7.794	0.849
0.800	0.800	7.173	7.756	0.847
0.900	0.900	7.173	7.719	0.845
1.000	1.000	7.173	7.682	0.843
1.100	1.100	7.173	7.645	0.841
1.200	1.200	7.173	7.608	0.839
1.300	1.300	7.173	7.571	0.837
1.400	1.400	7.173	7.535	0.835
1.500	1.500	7.173	7.498	0.833
1.600	1.600	7.173	7.462	0.831
1.700	1.700	7.173	7.426	0.829
1.800	1.800	7.173	7.391	0.827
1.900	1.900	7.173	7.355	0.825
2.000	2.000	7.173	7.320	0.823
2.100	2.100	7.173	7.284	0.821
2.175	2.175	7.173	7.258	0.820

FOR THE DISCHARGE AT THE END OF SEGMENT 1

DISCHARGER = BLACKSBURG STP

FLOW = 9 MGD CBOD5 = 36 Mg/L TKN = 15 Mg/L D.O. = 6.6 Mg/L

FLOW FROM INCREMENTAL DRAINAGE AREA = 2.9710 MGD

RESPONSE FOR SEGMENT 2

TOTAL STREAMFLOW = 327.9710 MGD
(Including Discharge, Tributaries and Incremental D.A. Flow)

DISTANCE FROM HEAD OF SEGMENT (MI.)	TOTAL DISTANCE FROM MODEL BEGINNING (MI.)	DISSOLVED OXYGEN (Mg/L)	cBODu (Mg/L)	nBODu (Mg/L)
0.000	2.175	7.157	9.508	2.215
0.100	2.275	7.149	9.441	2.208
0.200	2.375	7.143	9.375	2.200
0.300	2.475	7.138	9.309	2.192
0.400	2.575	7.133	9.244	2.185
0.500	2.675	7.129	9.179	2.177
0.600	2.775	7.126	9.115	2.170
0.700	2.875	7.124	9.051	2.162
0.800	2.975	7.122	8.987	2.154
0.900	3.075	7.121	8.924	2.147
1.000	3.175	7.121	8.861	2.139
1.100	3.275	7.121	8.799	2.132
1.200	3.375	7.121	8.738	2.125
1.300	3.475	7.122	8.676	2.117
1.400	3.575	7.123	8.615	2.110
1.500	3.675	7.124	8.555	2.102
1.600	3.775	7.126	8.495	2.095
1.700	3.875	7.128	8.435	2.088
1.800	3.975	7.131	8.376	2.080
1.900	4.075	7.133	8.317	2.073
2.000	4.175	7.136	8.259	2.066
2.100	4.275	7.139	8.201	2.059
2.200	4.375	7.142	8.143	2.052
2.300	4.475	7.146	8.086	2.045
2.400	4.575	7.149	8.029	2.037
2.500	4.675	7.153	7.973	2.030
2.600	4.775	7.157	7.917	2.023
2.700	4.875	7.161	7.861	2.016
2.800	4.975	7.165	7.806	2.009
2.900	5.075	7.169	7.751	2.002
3.000	5.175	7.173	7.697	1.995

REGIONAL MODELING SYSTEM
08-26-1994 15:12:29

Ver 3.2 (OWRM - 9/90)

DATA FILE = PEPXXX.MOD

Attachment E

- **Toxics Management Plan Justification Memorandum**

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office

3019 Peters Creek Road

Roanoke, VA 24015

SUBJECT: TMP Justification for Lower Stroubles Creek WWTP; VPDES Permit No. VA0060844
TO: Permit File
FROM: Kevin A. Harlow, Environmental Engineer Senior
DATE: April 18, 2014

DISCUSSION:

The table on the following page is a compilation of the acute and chronic toxicity testing data during the 2009 permit term. For outfall 001, the facility has completed five annual acute and chronic toxicity testing events using *Ceriodaphnia dubia* and *Pimephales promelas*, respectively. Additionally, chronic toxicity testing was performed using *Ceriodaphnia dubia* was conducted to satisfy the VPDES application requirements. The only test that demonstrated any toxicity was a 2011 chronic test using *Pimephales promelas* in which the TU_C was 3.16 for biomass. A reasonable potential analysis indicated no permit limit was needed.

RECOMMENDATIONS:

The facility should continue annual compliance monitoring using *Ceriodaphnia dubia* for the acute toxicity tests and *Pimephales promelas* for the chronic toxicity tests.

Lower Stroubles Creek WWTP - VA0060844
Whole Effluent Toxicity Data

Chronic - Pimephales promelas

Date_Begin	Date_End	Event	LC50	NOEC	TUc	% Survival in 100% Effluent
9/30/2009	10/7/2009	1st Annual	>100	100	1	97.5
9/28/2010	10/5/2010	2nd Annual	>100	100	1	92.5
10/11/2011	10/18/2011	3rd Annual	>100	31.6	3.16	100
10/16/2012	10/23/2012	4th Annual	>100	100	1	92.5
10/15/2013	10/21/2013	5th Annual	>100	100	1	97.5

Acute - Ceriodaphnia dubia

Date_Begin	Date_End	Event	LC50	TUa	% Survival in 100% Effluent
10/1/2009	10/3/2009	1st Annual	>100	<1	95
9/29/2010	10/1/2010	2nd Annual	>100	<1	100
10/10/2011	10/12/2013	3rd Annual	>100	<1	100
10/17/2012	10/19/2012	4th Annual	>100	<1	100
10/16/2013	10/18/2013	5th Annual	>100	<1	100

Chronic - Ceriodaphnia dubia

Date_Begin	Date_End	Event	NOEC%	% Survival in 100% Effluent
7/30/2012	8/5/2012	1st Application Test	100	100
9/10/2013	9/16/2013	2nd Application Test	100	100
10/15/2013	10/21/2013	3rd Application Test	100	100
11/19/2013	11/25/2013	4th Application Test	100	100